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PROCEEDINGS

OF THE

Biological Society of Washington

VOLUME XIX

1906

WASHINGTON
PRINTED FOR THE SOCIETY
1907

N 992

COMMITTEE ON PUBLICATIONS

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1108 E St. N. W.
Washington, D. C.

ILLUSTRATIONS

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OFFICERS AND COUNCIL

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

For 1906

(ELECTED DECEMBER 23, 1905)

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* Ex-Presidents of the Society

VOL. XIX, PP. VII-XVIII FEBRUARY 21, 1907

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

CONSTITUTION AND BY-LAWS.

CONSTITUTION.

ARTICLE I.—*Name.*

The name of this Society is the Biological Society of Washington.

ARTICLE II.—*Object.*

The object of the Society is the increase and diffusion of biological knowledge.

ARTICLE III.—*Members.*

The members of the Society shall be persons who are interested in biological science. There may be two classes of members, active and corresponding.

ARTICLE IV.—*Officers.*

The officers of the Society shall be a President, four Vice-Presidents, a Recording Secretary, a Corresponding Secretary, and a Treasurer.

There shall be a Council, consisting of the officers of the Society, the ex-presidents, the respective chairmen of the committees on Publications and on Communications, and five additional members.

The officers and the five additional members of the Council shall be elected annually by ballot, and shall hold office until their successors are elected. The Council shall have power to fill vacancies.

ARTICLE V.—*Amendments.*

This Constitution shall not be amended except by a three-fourths vote of the members present at an annual meeting for the election of officers, and notice of the proposed amendment must be submitted in writing at a regular meeting of the Society at least four weeks previously.

BY-LAWS.

Article I.—*Members.*

Active members only shall be entitled to vote and to hold office.

Persons residing outside of the District of Columbia may become corresponding members of the Society. They may attend its meetings, and take part in and contribute to its proceedings. Corresponding members may be transferred to active membership by the Council.

Nominations for membership shall be signed by three active members of the Society, and submitted to the Council through the Recording Secretary. They shall not receive action until they have been before the Council at least two weeks. After recommendation by a majority of the Council present at a regular meeting, nominations shall be acted upon at the next ensuing regular meeting of the Society, a majority vote of the members present being necessary to an election.

Notice of resignation of membership shall be given in writing to the Council.

Article II.—*Officers.*

The President shall preside at the meetings of the Society and of the Council. He shall appoint all committees except such as are otherwise provided for; and, jointly with the Recording Secretary, shall sign all written contracts and other obligations of the Society. In the absence of the President, his duties shall be performed by one of the Vice-Presidents.

The Recording Secretary shall keep minutes of the meetings of the Society and Council.

The Corresponding Secretary shall issue notices for the meetings of the Society and Council, shall notify members of their election, and conduct the correspondence. He shall have the custody of the records, except the minutes and the accounts of the Treasurer.

The Treasurer shall collect all moneys and, under the direction of the Council, disburse the same. He shall report upon the state of the funds at each annual meeting, and at other times if required. The accounts of the Treasurer shall be audited by a committee of three, to be appointed at least two weeks previous to the annual meeting. In the absence of the Treasurer, the Recording Secretary is authorized to receive the dues of members.

ARTICLE III.—*Dues.*

The annual dues of active and corresponding members shall be one dollar and fifty cents, payable at the beginning of the year, and no member in arrears shall be entitled to vote at the annual meeting for the election of officers or on any proposed amendments to this Constitution or By-Laws.

Members of either class shall be entitled to the publications of the Society upon payment of an additional annual fee of one dollar and fifty cents; but they shall receive such publications only for the years for which their full dues are paid. The names of those two years in arrears may at any time, by vote of the Council, be dropped from the list of members.

Any member not in arrears may become a life member on the payment of fifty dollars at one time, and be relieved from all further dues and other assessments. All moneys received in payment of life memberships shall be invested in a permanent publication fund.

The fiscal year shall terminate with the annual meeting.

ARTICLE IV.—*Meetings.*

The regular meetings of the Society shall be held at 8 o'clock P. M. on alternate Saturdays from October to May, inclusive, unless otherwise ordered by the Council. The place of meeting will be designated by the Council.

Special meetings may be called by the President, with the approval of the Council.

The regular meetings, with the exception of the annual meeting, shall be devoted to the presentation and discussion of scientific subjects.

The regular order of business shall be as follows:

1. Reading of minutes.
2. Reports of committees.
3. Balloting for members.
4. Miscellaneous business.
5. Reading of papers, discussions, and exhibition of specimens.

This order of business may be suspended at any time by a two-thirds vote of the members present.

The annual meeting for the election of officers shall be the last stated meeting in December.

The regular meeting preceding the annual meeting shall be set

apart for the delivery of the President's annual address, unless a special meeting is called for the purpose.

Persons interested in biological science may, upon invitation of a member, be present at any meeting of the Society except the annual meeting.

ARTICLE V.—*Annual Meeting and Election of Officers.*

The order of proceedings at the annual meeting shall be as follows:

1. Reading of the minutes of the last annual meeting.
2. Presentation of the annual reports of the Secretaries.
3. Presentation of the annual report of the Treasurer.
4. Announcement of the names of members who, having complied with Article III of these By-Laws, are entitled to vote on the election of officers.
5. Election of President.
6. Election of four Vice-Presidents.
7. Election of one Recording and one Corresponding Secretary.
8. Election of Treasurer.
9. Election of five additional members of the Council.
10. Consideration of amendments to the Constitution.
11. Reading of the rough minutes of the meeting.

The election of officers will be conducted as follows:

Nominations shall be made in each case by informal ballot and the result announced by the Secretary, after which the first formal ballot shall be taken.

In balloting for Vice-Presidents and the five additional members of the Council, each member shall write on one ballot as many names as there are officers to be elected, namely, four on the first ballot for Vice-Presidents, and five on the first ballot for members of the Council; and on each subsequent ballot as many names as there are officers still to be elected. Those persons who receive a majority of the votes cast shall be declared elected.

If in any case the informal ballot result in giving a majority for one or more of the persons balloted for, it may be declared formal by a majority vote.

ARTICLE VI.—*Committees.*

There shall be two standing committees, one on Communications and one on Publications.

ARTICLE VII.—*Communications.*

All communications presented at the meetings of the Society must be authorized by the Committee on Communications, and the said committee shall arrange the program for each meeting, unless otherwise directed by the Council.

ARTICLE VIII.—*Publications.*

The Committee on Publications shall have charge of all publishing, in accordance with the rules relating to publications.

ARTICLE IX.—*Sections.*

Sections representing special branches of biology may be established by the Council upon the written recommendation of ten members of the Society.

ARTICLE X.—*Unassigned Business.*

All the business of the Society not otherwise provided for shall be transacted by the Council.

ARTICLE XI.—*Amendments.*

These By-Laws may be amended by a majority vote of the members present at a meeting of the Society, due notice thereof having been given in writing at least four weeks previously.

RULES RELATING TO PUBLICATION.

The annual publication of the Biological Society of Washington shall consist of a volume entitled *Proceedings of the Biological Society of Washington*, in typography, paper, and general make up, except as herein otherwise specified, conforming, as nearly as maybe, to the volumes heretofore published under the same title.

SECTION 1. This volume shall be consecutively paged, and published in parts or brochures. A brochure may consist either of a separate article or of several short articles collected under the title *General Notes*. The brochures shall be designated by volume numbers and limiting pages and each shall bear the

title of the volume and the precise date of publication. As soon as practicable after the close of each year, a volume title page, a list of contents and illustrations of the volume, a list of officers and committees, an abstract of proceedings for the year, a general index to the volume, and such other matter as may be ordered by the Council, shall be issued as a separate brochure to complete the volume. All of this matter except the index shall be arranged for binding at the beginning of the volume under a distinct Roman pagination, but the index shall take the regular Arabic pagination at the end of the volume.

Section 2. The regular edition shall be five hundred and twenty-five copies.

Section 3. The matter published in the Proceedings of the Biological Society of Washington may comprise (1) original articles relating to biological science; (2) administrative records of the Society, including condensed minutes of meetings prepared by the Secretaries; (3) lists of members, by-laws and rules, resolutions of a permanent character, etc.; and (4) title pages, lists of contents, and indexes for each volume.

Section 4. Matter designed for publication in the Proceedings of the Biological Society of Washington may be transmitted to the Committee on Publications, either direct or through the Secretaries of the Society; soon as may be thereafter the Committee shall decide on the desirability and expediency of the publications, or refer the matter to the Council for decision. Communications from non-members and translated memoirs shall be published only upon unanimous vote of the Committee on Publication and by specific authority from the Council. The Committee on Publications or the Council may refer any communication to a special committee for examination.

Section 5. Matter offered for publication in the Proceedings of the Biological Society of Washington becomes thereby the property of the said Society and shall not be published elsewhere prior to publication in the Proceedings except by consent of the Council.

Section 6. Of the matter offered for publication, that which is rejected shall be returned to the author at once; that which is accepted shall be issued without unnecessary delay. Ordinarily brochures shall be held until several can be issued on the

same date, but authors desiring especially prompt publication may secure it by paying the cost of mailing.

Section 7. No description of a new species shall be published unless a type be designated and its present location and place of collection given, if this is known, and no description of a new genus unless the type species be definitely stated.

Section 8. The whole of the manuscript and all plates for figures shall be in the hands of the Committee on Publications before any paper is accepted for publication.

Section 9. Proofs of letter-press and illustrations shall be submitted to authors, or persons designated by them, whenever practicable, but printing shall not be unduly delayed by reason of absence or incapacity of authors.

Section 10. All details relating to abbreviations, the use of capitals and citations, and all matters of form not involving a change of meaning, shall rest with the Committee on Publications.

Section 11. The text of each brochure of the Proceedings of the Biological Society of Washington shall begin under its proper title on an odd-numbered page. It shall be accompanied by the illustrations pertaining to it, the plates consecutively numbered for the volume, and it may contain a synoptic list of contents, prepared by the author, and, at the option of the Committee on Publication, an alphabetic index, provided the same be prepared by the author.

Section 12. The author of each memoir shall receive twenty-five copies gratis and shall be authorized to order, through the Committee on Publications, any edition of exactly similar brochures, to be printed as author's separates, at cost of paper and press-work; but no author's separates of memoir brochures shall be issued except in this regular form.

Section 13. If special paper covers are desired for the author's edition of a brochure, they shall bear at the top of the first page the title of the volume, limiting pages and date of publication, and at the bottom the imprint of the Society.

Section 14. The bottom of each signature and of each initial page shall bear a signature mark, giving an abbreviated title of the serial, the volume, and the year, and every page shall be numbered, the initial pages at the bottom.

SECTION 15. The page-head titles shall consist of the name of the author and catch-title of paper.

SECTION 16. The date of publication of each brochure shall be that upon which the edition is delivered to the Committee on Publications.

SECTION 17. The brochures shall be distributed immediately by the Committee on Publications to subscribing members of the Society not in arrears for dues, and for an annual price of three dollars to regular subscribers, and to others in exchange or otherwise as the Council may authorize. The undistributed copies of each edition shall be filed and held for sale by the Committee on Publications at prices fixed by them.

PROCEEDINGS.

The Society meets in the Assembly Hall of the Cosmos Club on alternate Saturdays at 8 P. M. Brief notices of the meetings, with abstracts of the papers, are published in *Science*.

January 6, 1906—409th Meeting.

Vice-President Palmer in the chair and 40 persons present.

J. W. Titcomb exhibited a mud nest of the hornero or red oven-bird (*Furnarius rufus*) from Argentina.

L. O. Howard remarked upon the New Orleans meeting of the A. A. A. S.

Henry Van Deman exhibited two large apples, the Newtown and Esopus, from the Hood River Valley, Oregon.

The following communication was presented:

Alvin Seale: Notes on the Natural History of the South Pacific Islands.

January 20, 1906—410th Meeting.

Vice-President Palmer in the chair and 70 persons present.

Albert Mann related a case of the capture and raising from the floor of a snake by a spider in Pennington (N. J.) Seminary.

H. S. Barber noted an attack by the larva of a caryatid beetle upon a ring neck snake.

T. S. Palmer called attention to the importation of the kea, one of the parrots, into the United States, and of the arrival of ten thousand canaries, the largest single shipment ever received in this country.

The following communication was presented:

C. Hart Merriam: Is Mutation a Factor in the Evolution of the Higher Vertebrates?*

February 3, 1906—411th Meeting.

The President in the chair and 65 persons present.

The President read an invitation to the Society from the St. Louis Academy of Science to participate at a dinner commemorative of the 50th anniversary of the foundation of the Academy.

T. Wayland Vaughan exhibited a head of coral, *Orbicella cavernosa*, with an unexplained difference in the size of its polyps.

The following communications were presented:

T. Wayland Vaughan: The Work of De Vries and its Importance in the Study of the Problems of Evolution.

Gerrit S. Miller, Jr., (read by T. W. Vaughan): An Instance of Striking Specific Differentiation of Mammals under Uniform Environment.

February 17, 1906—412th Meeting.

Vice-President Palmer in the chair and 32 persons present.

The following communications were presented:

Paul Bartsch: Variation in the Shell of *Goniobasis virginica*, with an Outline for Breeding experiments.

O. F. Cook: The Nature of Evolutionary Motion.†

* Proc. A. A. A. S., LV, 383, 1906. Science N. S. XXIII, No. 581, 241, Feb. 16, 1906.

† Aspects of Kinetic Evolution. Proc. Wash. Acad. Sci., VIII, 197, 1906.

March 3, 1906—413th Meeting.

The President in the chair and 32 persons present.

The following communications were presented :

L. O. Howard: The Gypsy Moth and the Brown-tailed Moth and the Introduction of their European Parasites.*

A. S. Hitchcock: A Synopsis of the Genus *Tripsacum*.†

March 17, 1906—414th Meeting.

The President in the chair and 31 persons present.

The following communications were presented.

J. W. Gidley: Evidence Bearing on Tooth-cusp Development, Based on a Study of Mesozoic Mammals.‡

M. C. Marsh: Hemoglobin Estimates and Blood Counts in Fishes in Health and Disease.§

Austin H. Clark: A Case of Melanism in West Indian Honey Creepers.‖

March 31, 1906—415th Meeting.

Vice-President Palmer in the chair and 29 persons present.

The following communications were presented:

Ch. Wardell Stiles: A Plan to Ensure the Establishment of Type Species of Genera.¶

Rodney H. True: The Cultivation of Tea in the United States.

April 14, 1906—416th Meeting.

Vice-President Palmer in the chair and 75 persons present.

The following communication was presented:

D. T. MacDougal : The Delta and Desert of the Rio Colorado.**

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* Yearbook, Dept. Agric., 1905.

† Bot. Gaz. 41, 294, April, 1906.

‡ Proc. Wash. Acad. Sci., VIII, 91, 1906.

§ Wash. Med. Ann., I, 397, 1902.

‖ West Indian Black Forms of the Genus Cœreba. Auk XXIII, 392, Oct., 1906.

¶ Science N. S., XXIII, No. 592, 700, May 4, 1906.

** Bull. Amer. Geog. Soc., Jan., 1906. Contr. N. Y. Bot. Gard., No. 77.

May 12, 1906—417th Meeting.

The following communications were presented:

W. J. Spillman: Mendelian Characters in Cattle.*

T. H. Kearney: The Excretion of Hygroscopic Salts by Certain Desert Plants.†

October 20, 1906—418th Meeting.

The President in the chair and 50 persons present.

B. W. Evermann noted the successful introduction of Chinook salmon in Lake Sunapee, N. H.

J. N. Rose exhibited a curious desert plant, *Calibanus*, resembling a puff-ball.‡

C. V. Piper exhibited a specimen of the Japanese "hagi" (*Lespedeza bicolor*), showing the peculiar fasciation.

The following communication was presented:

W. J. Spillman: The Mechanism of Heredity.

November 3, 1906—419th Meeting.

The President in the chair and 27 persons present.

The following communications were presented:

Theodore Gill: The Work of *Pterophryne* and the Flying Fishes.

M. W. Lyon, Jr.: Local Races of Bornean Squirrels.

Karl F. Kellerman: The Use of Copper in Sanitation.

November 17, 1906—420th Meeting.

Vice-President Hay in the chair and 40 persons present.

A. S. Hitchcock made some remarks on the code of nomenclature adopted by the International Congress of Zoologists at Vienna.

A. A. Doolittle exhibited an abnormal rose.

The following communications were presented:

Edward L. Greene: On So-called *Rhus Toxicodendron*.

Barton W. Evermann: Fish Culture and Fish and Game Protection in the Cornell and Yale Forest Schools.

William Palmer: A Record of the Black Rat in Virginia.

* Science N. S., XXIII, No. 588, 549, Apr. 6, 1906.

† Science N. S., XIX, No. 480, 419, Mch. 11, 1904.

‡ Contr. Nat. Herb., **10**: 90, 1906.

December 1, 1906—421st Meeting.

The President in the chair and 50 persons present.

T. E. Wilcox called attention to the increase of quail and cottontail rabbits in central New York.

B. W. Evermann informed the Society of the death of two naval officers who have furthered biological science, Lieutenant Franklin Swift, retired, of the steamer *Fish Hawk*, on November 10, and Lieutenant-Commander LeRoy M. Garrett, of the steamer *Albatross*, on November 21.

The following communications were presented:

L. O. Howard: Polyembryony and Fixation of Sex.*

John W. Titcomb: Principles and Methods of Fish Culture.

December 15, 1906—422d Meeting.

TWENTY-SEVENTH ANNUAL MEETING.

The President in the chair and 50 persons present.

The annual reports of the committees, Recording Secretary, and Treasurer were read and accepted. The following officers were elected for the year 1907:

President: Leonard Stejneger.

Vice-Presidents: T. S. Palmer, W. P. Hay, E. L. Greene, E. W. Nelson.

Recording Secretary: M. C. Marsh.

Corresponding Secretary: Wilfred H. Osgood.

Treasurer: Hugh M. Smith.

Councillors: A. D. Hopkins, J. N. Rose, A. K. Fisher, A. B. Baker, David White.

The President announced the following standing committees for the year 1907:

Publications: W. P. Hay, Wilfred H. Osgood, Hugh M. Smith.

Communications: Vernon Bailey, A. B. Baker, A. D. Hopkins, J. N. Rose, J. W. Titcomb.

* Science, N. S., XXIV, No. 625, 810, Dec. 21, 1906.

VOL. XIX PP. 1-2 JANUARY 29, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON ORCHIDS NEW TO FLORIDA.

BY OAKES AMES.

Since the publication of my paper entitled "Additions to the Orchid Flora of Florida" which appeared in these proceedings on pages 115–117 of Vol. XVII, several species have come to hand which have never been reported as natives of Florida. Four of them belong to genera new to the United States. All are of West Indian origin, as far as it is possible to ascertain—an interesting fact in view of the peculiarly West Indian character of the Floridian orchid flora. With one exception, all of these orchids were collected by Mr. A. A. Eaton in 1904 and 1905.

Pleurothallis gelida Lindl.

Ten miles northeast of Everglade, Lee County, March 23–26, 1905, *A. A. Eaton*, No. 1401. The plants at the time they were found were not in flower, but subsequently, in December, 1905, produced flowers under cultivation. *P. gelida* Lindl. belongs to the section *Spathaceae*. The coriaceous leaves often exceed 14 cm. in length; the deliciously scented flowers are yellowish, pilose-hairy, and from 7 to 8 mm. long, in an upright raceme. The lip is cuneate, bicarinate. *P. univaginata* Lindl., which is closely allied to *P. gelida*, and might readily be mistaken for it, has smaller flowers and lacks the two longitudinal carinae on the lip. This is the first species of *Pleurothallis* which has been found in Florida.

Vanilla phaeantha Rchb. f.

Fahkahatchie Cypress, Lee County, June 10, 1904, *A. A. Eaton*, No. 1129. Probably the *Vanilla planifolia* Andr. of Chapman's Flora. The species of *Vanilla* are very difficult to study from herbarium material, as most of the large collections are scrappy, insufficient and quite unsatisfactory. I have compared Eaton's No. 1129 with authentic material at Kew and can discover no differences which would invalidate my determination. *V. phaeantha* Rchb. f. and *V. Eggersii* Rolfe appear to be the only representatives in Florida of the genus *Vanilla*.

Prescottia oligantha Lindl.

Hammock, near Gossmans, Dade County, February 22, 1905, *A. A. Eaton*, No. 1211. The first collection of this species in Florida was made by Mr. Eaton in 1903, when specimens were sent to North Easton alive, together with specimens of *Cranichis muscosa*, Sw. Its identity was not ascertained until January 14, 1905, when it bloomed under cultivation. The genus *Prescottia* has not heretofore been reported from Florida.

Hormidium tripterum Cogn.

On Pop Ash in cypress head, 10 miles northeast of Everglade, Lee County, March 23–26, 1905, *A. A. Eaton*, No. 1400. *Hormidium* is nearly allied to *Epidendrum* and is new to Florida.

Tetramicra Eulophiae Rchb. f.

Dade County, November 10, 1903, *Carter, Eaton and Small.* The material on which my determination is based was collected in an immature condition. Only a few plants were found. The name given above is merely provisional, although there does not appear to be much doubt regarding the identity of the plants. The genus *Tetramicra* is new to Florida.

Campylocentrum pachyrhizum Rolfe.

(Syn. *Aëranthus spathaceus* Grisebach.) On deciduous trees, northeast of Everglade, Lee County, March 23–26, 1905, *A. A. Eaton*, No. 1387. This is a larger species in every way than *Campylocentrum porrectum* Rolfe, which has already been reported from peninsular Florida. Roots 4 mm. broad; flowers numerous.

Vol. XIX, pp. 3-6 January 29, 1906

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

IDENTITY OF *THOMOMYS UMBRINUS* (RICHARDSON).

BY VERNON BAILEY.

In 1829, Richardson described and named *Geomys umbrinus* from a specimen then in possession of Mr. Leadbeater, a London dealer in natural history specimens. The name has since been the cause of much confusion and has been applied to or placed in synonomy under various species of *Thomomys* or else rejected as undeterminable. This state of confusion has resulted from lack of a definite type locality. Richardson's statement that the specimen "came from Cadadaguois, a town in the southwestern part of Louisiana," is evidently an error, as the only use of such name in that region was for the Cadadaguois Indian settlements on the Red River in northeastern Texas. This place, however, is several hundred miles from the range of any species of *Thomomys*. Hence, if the name *umbrinus* is ever fixed it must be by identification of a known species with the original Leadbeater specimen, now in the British Museum. In March, 1905, Dr. Merriam sent to Mr. Gerrit S. Miller, Jr., then in London, specimens of *Thomomys fulvus*, *fossor*, and *lachuguilla*, the three species nearest in range to the region that in 1829 was comprised in southwestern Louisiana, for comparison with the type specimen of *umbrinus*. Mr. Miller found that none of these agreed in either cranial or external characters with the type, which he described in detail as follows:

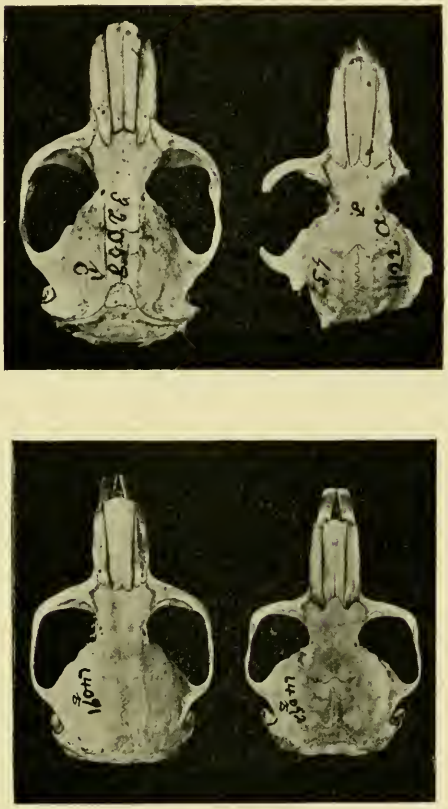
The type of *Thomomys umbrinus* is a formerly mounted specimen in the British Museum, No. 55. 12. 24. 205, a male in good condition, and with skull in good condition except for one zygoma, one bulla, and the right half of the occipital region. It is a *Thomomys* but not the same as any of those sent for comparison. Externally it is most like *fulvus*, but smaller and with more slender claws, especially in front. Color above about as in *fulvus*, but slightly darker, underparts entirely different, much as in *fossar* [pale buffy] but even paler, with almost a sharp line of demarkation along

sides; a white patch on chin and throat; tail as in *fossor*, but a little darker, apparently dirty, not bicolor as in *fulvus;* feet dull whitish.

Skull nearer that of *fulvus* than of *fossor* or *lachuguilla*, but smaller, the rostrum shorter and relatively broader, nasals and premaxillæ ending in line with each other; anterior base of zygoma, viewed from above, emarginate instead of rounded, lachrymal applied almost entirely to zygoma instead of frontal. [Description accompanied by rough drawing showing peculiarity of zygoma.]

Measurements.—Skin, measured dry: Total length 220; tail 45; hind foot 26. Skull: Greatest length 37.6; diastema 14; front of occiput to tip of nasals 34; nasals 13; interorbital constriction 6.4; zygomatic breadth (approximately) 26; upper tooth row (alveola) 7.8.

From this description it was evident that the type did not agree with any species of *Thomomys* from the United States, but that it did agree closely with an unrecognized species in the Biological Survey Collection, from Boca del Monte, Vera Cruz, Mexico. After Mr. Miller's return, one of the Boca del Monte specimens was sent to Mr. Oldfield Thomas, Curator of Mammals in the British Museum, for comparison with the type. Mr. Thomas kindly made the comparison and was not convinced that they were the same; but the discrepancies which he pointed out, namely, broad and strongly orange-colored incisors, longer nasals, broader posterior tip of premaxillæ, larger size, and much stronger color of the type specimen, are practically covered by individual variation in the series from Boca del Monte. The full size photograph of the skull of the type, furnished by Mr. Thomas and here reproduced, shows unmistakable characters, restricting *umbrinus* to a group of forms occurring only in southern Mexico. The strongly emarginate, instead of rounded, anterior base of the zygoma does not occur in any species of *Thomomys* from the United States. The combination of this character with a short wide skull, projecting incisors, wide posterior part of premaxillæ, and the peculiar position of the lachrymal which lies almost entirely against the jugal instead of mainly against the frontal, occurs only in *orizabæ*, *peregrinus* and the Boca del Monte form. External characters which still further restrict the name *umbrinus* to the Boca del Monte form are the white throat and light lowerparts, in strong contrast to the dark upperparts. Boca del Monte also has the advantage of being the farthest east and probably, previous to 1829, one of



SKULLS OF *Thomomys fulvus* and *umbrinus*. ALL NATURAL SIZE.

No. 32,058 *Thomomys fulvus* from Springerville, Arizona.
No. 1,122 *Thomomys umbrinus*. Photograph of type specimen in British Museum.
Nos. 64,091 and 64,092 *Thomomys umbrinus* from Boca del Monte, Vera Cruz, Mexico.

the most accessible localities in Southern Mexico from which any species of *Thomomys* is known.

The following description is based on 8 specimens from Boca del Monte, Vera Cruz, Mexico:

Thomomys umbrinus (Richardson).

Geomys umbrinus Richardson. Fauna Boreali-Americana, I, pp. 190 and 202, 1829.

General characters.—Size medium, hind foot 27 to 28; colors dichromatic, dull umber brown or plumbeous black; skull short and wide with strongly projecting incisors.

Color.—Upperparts, in brown phase, dull burnt umber or Prouts brown, varying to nearly black in some specimens; lowerparts lightly washed with pale buff or whitish, in some specimens sharply contrasted with dark upperparts; feet, tip of tail, chin, and sometimes throat, white. In black phase slaty black all over except white chin, feet, and tip of tail.

Skull.—Short and wide with incisors projecting well beyond nasals; angle of frontal projecting into notched anterior base of zygoma; lachrymal applied for nearly its whole length to zygoma; premaxillæ of approximately the same length as nasals and widest near blunt posterior tips; incisors slender, in comparison with those of *fulvus;* color of incisors varying from light yellow to dark orange.

Measurements.—Average of seven adults from Boca del Monte: Total length, 193; tail vertebræ, 58; hind foot, 27. *Skull*, No. 64,091, ♂, from Boca del Monte: Greatest length, 36; diastema, 13.5; front of occiput to tip of nasals, 33; nasals, 12.5; interorbital constriction, 6.4; zygomatic breadth, 24; alveolar length of upper molar series, 7.5.

VOL. XIX, PP. 7-16 JANUARY 29, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

SOME OBSERVATIONS CONCERNING THE AMERICAN FAMILIES OF OLIGOMYODIAN PASSERES.*

BY ROBERT RIDGWAY.

By permission of the Secretary of the Smithsonian Institution.

This section of the Superfamily Mesomyodi† comprises, according to Dr. Sclater, eight family groups, namely, the "Oxyrhamphidæ" (Oxyruncidæ), Tyrannidæ, Pipridæ, Cotingidæ, Phytotomidæ, Philepittidæ, Pittidæ and Xenicidæ, all of which, except the three last named, are peculiar to America, the families of Mesomyodi being distinguished in Dr. Sclater's "keys" as follows:

OLIGOMYODÆ.‡

a. Tarsus exaspidean.

a¹. Toes nearly free (as in the Oscines).

{ Bill incurved, hooked - - - 1. **Tyrannidæ.**
{ Bill straight, pointed - - - 2. **Oxyrhamphidæ.**

b¹. Toes more or less united - - - 3. **Pipridæ.**

b. Tarsus pycnaspidean.

{ Bill elongated, compressed, not serrated 4. **Cotingidæ.** ⁂
{ Bill short, conical, serrated - - 5. **Phytotomidæ.**

c. Tarsus taxaspidean - - - - - - 6. **Philepittidæ.**

d. Tarsus ocreate.

{ Rectrices 12 - - - - - 7. **Pittidæ.**
{ Rectrices 10 - - - - - 8. **Xenicidæ.**

* *Oligomyodæ* Huxley, Proc. Zool. Soc. Lond., 1867, 471, part (includes Eurylaimidæ).—*Oligomyodi* Garrod, Proc. Zool. Soc. Lond., 1876, 517 (Eurylaimidæ excluded).—*Haploophonæ* Garrod, Proc. Zool. Soc. Lond., 1876, 517, 518 (comprises Tyrannidæ, Rupicolidæ, and Pipridæ); Forbes, Proc. Zool. Soc. Lond., 1880, 389-391 (adds Philepittidæ and "Acanthisittidæ" = Xenicidæ).—*Tyrannoideæ* Stejneger, Standard Nat. Hist., iv, 1885, 460, 463.

† See Birds of North and Middle America, I, p. 16.

‡ Cat. Birds Brit. Mus., xiv, 1888, 2.

⁂ The Cotingidæ of Dr. Sclater includes the Rupicolidæ.

TRACHEOPHONÆ.*

A. Sternum with one pair of posterior notches.
  a. Tarsus endaspidean - - - - - 1. **Dendrocolaptidæ.**†
  b. Tarsus taxaspidean - - - - - - 2. **Formicariidæ.**
B. Sternum with two pairs of posterior notches.
  a. Tarsus exaspidean - - - - - 3. **Conopophagidæ.**
  b. Tarsus taxaspidean - - - - - - 4. **Pteroptochidæ.**

It is thus seen that the character of the tarsal envelope is Dr. Sclater's chief reliance in the discrimination of these groups. This character is undoubtedly one of considerable importance, probably the most important of any single external character; but unfortunately when carefully tested it does not work out so beautifully as would appear from Dr. Sclater's presentation of the case. If it did, certain genera referred by him to the Tyrannidæ would belong to the Cotingidæ, while a considerable number of genera referred by him to the latter group could not be placed at all, since their tarsal envelope is neither exaspidean, pycnaspidean, taxaspidean, nor ocreate. It is evident, therefore, that a really "workable" key must be based on other characters in addition to that of the tarsal envelope. An effort to devise a satisfactory one has engaged a considerable amount of my time; but, while I believe that some improvement has been made, I must confess that it does not wholly satisfy me, and the results are herewith presented only as a provisional classification, with the observation that a really natural one is scarcely possible until the internal structure of all the genera has been studied.

PROVISIONAL KEY TO THE FAMILIES OF MESOMYODI.

a. Syrinx broncho-tracheal (typically Passerine). (*Oligomyodi.*)
  b. Syringeal muscles anachromyodous; tarsal envelope exaspidean; middle toe coherent with outer toe for not more (usually less) than the whole length of its basal phalanx.
    c. Bill cuneate, its tip acute and not at all uncinate.
      1. **Oxyruncidæ.**
    cc. Bill not cuneate nor acute, its tip more or less uncinate.
      2. **Tyrannidæ.**
  bb. Syringeal muscles catacromyodous; tarsal envelope not exaspidean, or else (Pipridæ) the middle toe coherent with outer toe for more than its basal phalanx or (genus *Pipreola* of Pipridæ) coherent with inner toe for whole of its basal phalanx.
    c. Temporal fossæ normally Passerine.
      d. Intrinsic muscles normally catacromyodous; tongue not penicillate.

* Cat. Birds Brit. Mus., xv, 1890, 2.

† The Dendrocolaptidæ of Dr. Sclater includes the very distinct family Furnariidæ.

e. Rectrices 12; bill not subulate nor acute; tarsal envelope not fused.

f. Heteromerous (the main artery of the thigh femoral).

g. Tarsal envelope exaspidean (as in Oxyruncidæ and Tyrannidæ); second phalanx of middle toe partly (sometimes wholly) coherent with outer toe or else (genus *Piprites*) the first phalanx wholly coherent with inner toe. 3. **Pipridæ.**

gg. Tarsal envelope not exaspidean (usually pycnaspidean, holaspidean or modified taxaspidean); second phalanx of middle toe wholly free from outer toe (or else, in genus *Phænicircus*, inner side of tarsus feathered), never wholly coherent with inner toe. - 4. **Cotingidæ.**

ff. Homœomerous (the main artery of thigh sciatic).

g. Bill compressed, with smooth tomia; head with a conspicuous, compressed, semicircular, bilateral crest; outermost primary abruptly attenuated at tip; inner secondaries abnormally broad, truncated. - - 5. **Rupicolidæ.**

gg. Bill conical (finch-like), with serrated tomia; head without crest; outer primary and inner secondaries normal. 6. **Phytotomidæ.**

ee. Rectrices 10; bill subulate, acute; tarsal envelope fused (ocreate). - - - - - - - 7. **Xenicidæ.***

dd. Intrinsic muscles peculiarly expanded at lower insertion, not attached to bronchial semirings, which are peculiarly modified; tongue penicillate. - - - 8. **Philepittidæ.**

cc. Temporal fossæ extending across occipital region of skull, the two of opposite sides nearly meeting on median line. 9. **Pittidæ.**

aa. Syrinx tracheal. (*Tracheophonæ.*)

b. One pair of tracheo-bronchial muscles; tarsal envelope exaspidean or taxaspidean; metasternum 4-notched (except in Formicariidæ).

c. Metasternum 4-notched; tensor patagii brevis quasi-picarian; nares holorhinal.

d. Tarsal envelope exaspidean; no intrinsic muscles; sterno-trachealis not attached to processus-vocales; palate schizognathous; mesorhinium normal; nostrils not conspicuously operculate. - - - - - - - 10. **Conopophagidæ.**

dd. Tarsal envelope taxaspidean; intrinsic muscles present; sterno-trachealis attached to processus vocales; palate aegithognathous (Oscine); mesorhinium compressed and arched, or expanded into a flattened oval shield; nostrils conspicuously operculate. - - - - - 11. **Pteroptochidæ.**

cc. Metasternum 2-notched; tensor patagii brevis normally Passerine; nares schizorhinal. - - - - 12. **Formicariidæ.**

bb. Two pairs of tracheo-bronchial muscles; tarsal envelope endaspidean; metasternum 2-notched.

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* See Pycraft, Ibis, Oct., 1905, 603–621, pl. 13, where the possibility of nearer relationship to Furnariidæ is suggested.

c. Nares holorhinal or modified schizorhinal; palate schizognathous; outer toe much shorter than middle toe (not conspicuously longer than inner toe), the three anterior toes coherent for much less than full length of their basal phalanges. 13. **Furnariidæ.**

cc. Nares holorhinal; palate aegithognathous or semi-desmognathous; outer toe nearly (sometimes quite) as long as middle toe, both conspicuously longer than inner toe, the three anterior toes coherent (fused) for entire length of their basal phalanges. 14. **Dendrocolaptidæ.**

It should be stated here that the Tracheophonæ have not yet been critically studied by me and that the above scheme is purely eclectic. It may be that when these are taken in hand a similar nonconformity of the character of the tarsal envelope to Dr. Selater's keys may be discovered as in the case of the Cotingidæ. The same remarks apply in part to the Oligomyodian family Pittidæ.

So few of the Mesomyodian forms have been studied as to their internal structure that I feel sure a satisfactory increase of our knowledge in this respect will result in more or less fundamental modification of our present views as to their classification. The anachromyodous syrinx and homœomerous thigh-artery of many genera of Tyrannidæ as well as the catacromyodous syrinx and heteromerous thigh of many forms of Pipridæ and Cotingidæ are, for example, merely assumed, and there may be many exceptions to these supposedly diagnostic characters of the groups in question. So far as external characters are concerned, certainly some genera commonly referred to the Cotingidæ can be separated from the Tyrannidæ only by their non-exaspidean tarsal envelope, and at the same time certain genera commonly referred to the Tyrannidæ also have the tarsal envelope non-exaspidean. In the group called Cotingidæ the character of the tarsal envelope is exceedingly variable, and the homogeneity of the group is open to very serious doubt. Of all external characters, to which present recourse is necessarily limited, the character of the tarsal envelope is by far the most nearly diagnostic, for the Oligomyodi may be sharply divided into two major groups, one of which, comprising Oxyruncidæ, Tyrannidæ (as here defined) and Pipridæ, having the tarsus exaspidean, the other, comprising Cotingidæ, Rupicolidæ, and Phytotomidæ, among American forms, having the tarsus

non-exaspidean. I am led to attach great value to this character for the reason that no matter how great the variations in general form or specialization of other characters within the Tyrannidæ and Pipridæ the character of the tarsal envelope is practically uniform throughout these groups.

Tyrannidæ.

In order to get as clear an understanding as possible of the classification of the Tyrannidæ, all the genera available* have been carefully examined and compared. Many days were devoted to an attempt to construct a "key" to all the genera in hand, but it finally became evident that the undertaking was much too formidable for the limited time which could be devoted to it, and therefore it became necessary to restrict the key to those genera belonging to North and Middle America, together with a few South American genera which were included for purpose of comparison. Even with this elimination of half the genera the task has proven exceedingly difficult and the results far from satisfactory, although it is believed that some improvement has been made over the "purely provisional" arrangement in Vol. XIV of the "Catalogue of Birds in the British Museum," in which the so-called families are without question purely artificial and the allocation of certain genera obviously wrong.† The subject has called forth a very pertinent and interesting paper by Dr. von Ihering,‡ in which a partial reconstruction of Dr. Sclater's "subfamilies," based on biological facts (chiefly the character of nests and eggs), is shown to be necessary, the proposed changes being as follows :

(1) The Tæniopterinæ restricted by elimination of the genera *Sayornis*, *Sisopygis* and, probably, *Machetornis*.

(2) The Platyrhynchinæ divided into two groups, Euscarthminæ and Serpophaginæ.

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*The only genera not seen by me are *Ochthornis* Sclater, *Ceratotriccus* Cabanis, *Pseudotriccus* Taczanowski and Berlepsch, *Leptotriccus* Cabanis and Heine, *Pseudomyobius* Salvadori and Festa, *Planchesia* Bonaparte, *Tæniotriccus* Berlepsch, *Chæomyias* Berlepsch, and *Acrochordopus* Berlepsch and Hellmayr.

†As an example may be cited the reference of one species of *Sayornis* (than which there are few if any more natural genera) to the "Tyranninæ" and the remaining species to the "Tæniopterinæ," almost at opposite extremes of the arrangement!

‡The Biology of the Tyrannidæ with respect to their systematic arrangement. The Auk, XXI, July, 1904, 313-322.

(3) The Elaininæ restricted by elimination of the genera *Rhynchocyclus*, *Legatus*, *Myiozetetes*, *Conopias*, *Pitangus*, *Sirystes*, and *Myiodynastes*, which, except the first (referred to the Euscarthminæ), should constitute a subfamily Pitanginæ, morphologically intermediate between the Elaininæ and Tyranninæ, and doubtfully separable from the latter.

In my opinion these suggested modifications in the arrangement of the Tyrannidæ are, in the main, entirely justifiable; but I am convinced that they are but a step toward much more radical changes which will be necessary before a satisfactory exposition of the phylogeny of the group can be made; and, while not prepared to forecast these with any degree of certainty will express my belief that (1) the genera *Agriornis* and *Muscisaxicola* are each quite sui generis and are not by any means as closely related to *Tænioptera* as the latter is to *Tyrannus;* and (2) that a considerable number of genera do not belong to the Tyrannidæ at all but must be transferred to other groups, since in none of them is the tarsal envelope exaspidean, the only external character except that of slight syndactylism (very variable within the group) which can be said to be really diagnostic of the family. These genera are (1) *Lawrencia* which has a typically Oscine tarsus and is without doubt a member of the Vireonidæ. (2) *Stigmatura*, (3) *Hapalocercus*, and (4) *Habrura*, which have taxaspidean tarsi; (5) *Muscigralla*, (6) *Sirystes*, (7) "*Myiarchus*" *validus* and (8) *Ramphotrigon*, which have essentially holaspidean tarsi; (9) "*Pogonotriccus*" *zeledoni*, (10) "*Myiopagis*" *gaimardi*, (11) *Tyrannulus elatus*, (12) "*Tyrannulus*" (i. e. *Microtriccus*) *semiflavus* and *brunneicapillus*, and (13) *Ornithion inerme*, which have essentially pycnaspidean tarsi, and (14) *Culicivora*, which has non-exaspidean tarsi and only ten rectrices.

These genera, which I conclude do not belong to the Tyrannidæ, unless some new definition of the family be made, may be again referred to in order to show more clearly why they should be excluded from the group under consideration, as at present susceptible of definition.

1. Lawrencia Ridgway.

(Type *Empidonax nanus* Lawrence.)

This genus has a typical Oscine acutiplantar tarsal envelope. It has ten obvious primaries, of which the tenth (outermost) is about half as long as

the ninth; the basal phalanx of the middle toe is completely united to the outer toe and almost wholly adherent to the middle toe, thus agreeing, as in the wing-structure, with the Vireonidæ. In fact, except for its depressed and broadly triangular "flycatcher"-like bill, the bird is minutely similar to *Vireo pusillus*.

2. Stigmatura Sclater and Salvin.
(Type, *Culicivora budytoides* D'Orbigny and Lafresnaye.)

This bird resembles in general form and appearance the Formicariine genus *Formicivora*, and probably belongs to the same family.

3. Hapalocercus Cabanis.
(Type *Euscarthmus meloryphus* Maximilian.)

This also is possibly Formicariine in its relationships. One species has been referred to it which has the typical Tyrannine exaspidean tarsus and therefore can not be congeneric. This is *Alectrurus flaviventris* D'Orbigny and Lafresnaye (*Hapalocercus flaviventris* Cabanis, Sclater, and others), type of the genus *Myiosympotes* Reichenbach (Av. Syst. Nat., 1850, pl. 65), and therefore to be known as *Myiosympotes flaviventris*. I have not seen *H. fulviceps* (*Euscarthmus fulviceps* Sclater) nor *H. acutipennis* Sclater and Salvin, and therefore can not say whether they are congeneric with *H. melacoryphus* or not; but the former doubtless is, since what is said to be a very near relative, *H. paulus* Bangs, is a true *Hapalocercus*.

4. Habrura Cabanis and Heine.
(Type, *Sylvia pectoralis* Vieillot.)

The tarsal envelope of *Habrura*, while less typically taxaspidean than that of *Hapalocercus* is by no means exaspidean. The inner side of the planta tarsi consists of a single continuous series of well-defined quadrate scutella; but on the outer side of the tarsus the acrotarsium extends quite to the posterior edge except for the upper third, where three or four rather large and very distinct longitudinal scutella occupy approximately the posterior half. The last character is seen in many typical Tyrannidæ; but in none of the latter is there ever any indication of the well-defined and continuous series of scutella along the posterior half of the inner side of the tarsus. The nostrils in *Habrura* are quite different from those of *Hapalocercus*, being roundish and nonoperculate while in the latter they are more longitudinal, relatively larger, and overhung by a rather large membraneous operculum. The proper place for these two genera is a question which I am not able to decide, but *Habrura* may not be out of place in the Cotingidæ while, as suggested above, *Hapalocercus* may belong to the Formicariidæ.

5. Muscigralla D'Orbigny and Lefresnaye.
(Type, *M. brevicauda* D'Orbigny and Lafresnaye.)

The appearance of this very peculiar form does not in the least suggest to me any relationship with the Tyrannidæ, while its holaspidean tarsi certainly exclude it from that family. Possibly it is a Formicarian.

6. Sirystes Cabanis and Heine.
(Type, *Muscicapa sibilator* Vieillot.)

This genus has the arrangement of the tarsal envelope precisely as in the Cotingine genera *Lipaugus* and *Casiornis*, and if these belong to the Cotingidæ there can be no doubt that *Sirystes* does also.

7. "Myiarchus" validus Cabanis.
(Type of genus *Hylonax* Ridgway.)

The same remarks apply to this as to *Sirystes*, and I would place *Hylonax* between the above-named genera and *Attila*.

8. "Pogonotriccus" zeledoni Lawrence.
(Type of genus *Idiotriccus* Ridgway.)

In this curious form the tarsus may be called ultra-pycnaspidean, for not only the planta tarsi but also the lower portion of the acrotarsium is broken up into numerous small scutella, which on the lower portion of the tarsus are almost tuberculate. I have not seen the type species of the genus *Pogonotriccus* Cabanis and Heine (*Muscicapa eximia* Temminck) and therefore can not say whether the latter is Tyrannine or not. The only species commonly referred to the genus that I have been able to examine, besides *Idiotriccus zeledoni*, is *P. plumbeiceps* Lawrence, which von Berlepsch places in the genus *Tyranniscus* Cabanis and Heine, an allocation in which I entirely agree.

9. "Elainea" gaimardi (D'Orbigny).
(*Muscicapa gaimardi* D'Orbigny, = *Elainea elegans* Pelzeln, type of genus *Elainopsis* Ridgway.)

This bird, while superficially resembling very closely the Tyrannine genus *Myiopagis* Salvin and Godman has essentially pycnaspidean tarsi, the acrotarsium extending only a little more than half way across the outer side of the tarsus and the planta tarsi covered with minute scutella. I therefore refer it to the Cotingidæ.

10. Tyrannulus Vieillot.
(Type, *Sylvia elata* Latham.)

This also has essentially pycnaspidean tarsi, and for that reason is transferred from the Tyrannidæ to the Cotingidæ. *T. semiflavus* Sclater and Salvin while agreeing in pycnaspidean tarsi is very different otherwise and is the type of my genus *Microtriccus*.

11. Ornithion Hartlaub.
(Type. *O. inerme* Hartlaub.)

This also has pycnaspidean tarsi and is most nearly related to *Microtriccus*. The bill in both these genera, but especially in *Ornithion*, is decidedly Cotingine in form. *Ornithion* is, so far as known, monotypic, the other species commonly referred to it being true Tyrannidæ (having exaspidean tarsi) and constitute the genus *Camptostoma* Sclater.

12. Culicivora Swainson.
(Type, *Muscicapa stenura* Temminck.)

The tarsal envelope of this genus appears on first sight to be exaspidean; but, while the acrotarsium entirely crosses the outer side of the tarsus and occupies the greater part of the inner side, there is interposed between the two edges a continuous series of very distinct lozenge-shaped scutella. The style of coloration (conspicuously streaked above) is very different from that of any true Tyrannine form and recalls that of some Synallaxinæ (Furnariidæ) or some of the smaller Formicariidæ.

Pipridæ.

The diagnosis of this group as given by Dr. Sclater requires no modification, all possessing an exaspidean tarsal envelope, like the Tyrannidæ, but differing from the latter in having the second phalanx of the middle toe at least half (usually wholly) united to the outer toe or else (in the genus *Piprites* only) having the first phalanx of the middle toe wholly coherent with the inner toe. Nevertheless the characters of the group necessitate the exclusion of one genus (*Ptilochloris** Swainson) and its transfer to the Cotingidæ, and the addition (a substraction from Cotingidæ) of another (genus *Aulia* Bonaparte).

Cotingidæ.

The Cotingidæ are characterized by Dr. Sclater (Cat. Birds Brit. Mus., xiv, 1888, 2) as Oligomyodian birds with pycnaspidean tarsi—no other character for the group being given. Nevertheless, as a matter of fact, a considerable number of the genera belonging to the group as limited by Dr. Sclater have *not* pycnaspidean tarsi, though it is equally true that none of them have the tarsal envelope exaspidean. The group is an exceedingly complex one, and I have very strong doubts as to its homogeneity. *Rupicola* I certainly would exclude as a separate family, Rupicolidæ; and I believe that when more is known of their internal structure disintegration of the group will go farther.

So far as external characters are concerned, I am able to diagnose the Cotingidæ, as a separate group from the Tyrannidæ and Pipridæ, only by their different (non-exaspidean) tarsal envelope; but if the group were limited to those forms possessing pycnaspidean tarsi it would be very much more restricted

* I am using the names adopted by Dr. Sclater, it being unnecessary to discuss here whether *Laniisoma* Swainson and *Laniocera* Lesson should not displace *Ptilochloris* and *Aulia* respectively.

than the Cotingidæ of Dr. Sclater. Those genera of Cotingidæ possessing non-pycnaspidean tarsi present three recognizably different types of scutellation of the planta tarsi; two of these types approach most nearly to the holaspidean and taxaspidean, but for the third, in which the whole planta tarsi consists of smooth integument, I am unable to find a distinctive term.

If certain genera (as *Lipaugus*, *Casiornis*, *Lathria*, and *Attila*) which by nearly universal usage are placed in the Cotingidæ really belong to that group, then most certainly do certain genera usually referred to the Tyrannidæ also belong there, for the character of the tarsal scutellation is essentially if not precisely similar. These genera, *Sirystes*, *Ramphotrigon*,* and *Hylonax* (type, *Myiarchus validus* Gosse) I therefore add to the Cotingidæ, as well as others which possess essentially pycnaspidean or at least non-exaspidean tarsi, namely, "*Pogonotriccus*" *zeledoni* (type of genus *Idiotriccus* Ridgway), "*Elainea*" or "*Myiopagis*" *gaimardi* (type of *Elainopsis* Ridgway), *Tyrannulus elatus*, "*Tyrannulus*" *semiflavus* (type of *Microtriccus* Ridgway), and *Ornithion*—possibly also *Habrura*. There should also be added a supposedly Piprine genus, *Ptilochloris* (or *Laniisoma*), which has neither the exaspidean tarsus nor great syndactylism of the Pipridæ. At the same time, the exclusion from Cotingidæ and addition to Pipridæ of the genus *Aulia* (or *Laniocera*) is made necessary, since its foot-structure and tarsal scutellation is typically Piprine.

* Equals *Rhynchocyclus*, part, of Dr. Sclater. *Ramphotrigon* Gray, Cat. Gen. and Subgen. Birds, 1855, 146, ex "Pr. B [onaparte] 1854." (Type, *Platyrhynchus ruficauda* Spix.)

Vol. XIX pp. 17-22 February 26, 1906

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

BREEDING BIRDS OF THE SIERRA DE ANTONEZ, NORTH CENTRAL SONORA.

BY JOHN E. THAYER AND OUTRAM BANGS.

During some months last spring and summer spent in traveling about in Sonora to establish the present range of the vanishing *Colinus ridgwayi*, Mr. W. W. Brown, Jr., made small collections of birds at several different points. Most of the places visited are pretty well known, and nothing of special interest was taken. One region, however, where Mr. Brown remained through the height of the breeding season, is less well known, and a nominal list of the birds taken there is perhaps worth publishing.

This place is a range of low mountains known as the Sierra de Antonez, in north central Sonora, about latitude 30°, longitude 110°+ and 95 miles south of the Arizona boundary, but extending almost to the boundary in a series of lower foot-hills. These mountains make a slight watershed, the Rio de Sonora and San Miguel rising there and flowing south, then west, and branches of the Gila River rising in their northern end and flowing north.

Mr. Brown collected here from the last few days of April to the first of June, principally at Opodepe, 2,000 feet altitude, and La Chumata mine, 4,500 feet altitude; the two places about 20 miles apart east and west. La Chumata mine is situated on the south side of La Chumata cañon, 275 feet above its bottom. Through the cañon flows a brook which in the rainy season becomes quite a river, and along its banks the vegetation is luxuriant, cottonwood, birch, willow and oak being the characteristic trees. The peaks above are rather more barren, three species of oaks being the characteristic trees, with long grass growing under them. The commoner birds of the cañon were

Cooper's tanager, McLeod's sparrow, painted redstart, Californian woodpecker, Nelson's oriole, Scott's oriole, and the wood pewee. On the higher peaks above, the hepatic tanager, Arizona jay, Arizona woodpecker, blue gray gnatcatcher, Scott's sparrow, and Mearns's quail were the characteristic species.

Mr. Brown took many nests with sets of eggs, most interesting of which is perhaps that of McLeod's sparrow (*Aimophila mcleodii* Brewster), of which he secured a number of sets. Mr. Brown thinks his collection a very good representative one of the breeding birds of the region, as he saw but one species, *Urubitinga anthracina* (Licht.), that he fully identified, but failed to get.

The following is a nominal list of the species taken:

Podilymbus podiceps (Linn.).

Opodepe.

Buteo borealis calurus Cassin.

La Chumata.

Buteo swainsoni Bp.

Opodepe.

Accipiter cooperi mexicanus Swains.

La Chumata.

Cyrtonyx montezumæ mearnsi Nelson.

La Chumata.

Lophortyx douglasi bensoni (Ridg.).

Opodepe.

Lophortyx gambeli fulvipectus Nelson.

Opodepe.

Zenaidura carolinensis carolinensis (Linn.).

Opodepe; La Chumata.

Melopelia leucoptera (Linn.).

Opodepe; La Chumata.

Scardafella inca inca (Less.).

Opodepe.

Columbigallina passerina pallescens Baird.

Opodepe.

Phæoptila latirostris (Swains.).

Opodepe; La Chumata.

Colaptes chrysoides (Malh.).

Opodepe.

Melanerpes formicivorus melanopogon (Temm.).

La Chumata. The twenty-three skins taken represent a race not quite typical of any of the named forms. The bill is smaller than in Californian specimens, and the breast rather more streaked. The band on the crown is nearly as narrow as in *augustifrons*.

Melanerpes uropygialis (Baird).

Opodepe.

Dendrocopus arizonæ (Hargitt).

La Chumata.

Pyrocephalus rubineus mexicanus Sclater.

Opodepe.

Empidonax difficilis Baird.

La Chumata.

Horizopus richardsoni (Swains.).

La Chumata.

Myiarchus mexicanus magister Ridg.

La Chumata.

Myiarchus cinerascens cinerascens (Lawr.).

La Chumata; Opodepe.

Myiarchus lawrencei olivascens Ridg.

La Chumata.

Tyrannus verticalis Say.

Opodepe.

Tyrannus vociferans Swains.

Opodepe; La Chumata.

Mimus polyglottos leucopterus (Vig.).

Opodepe.

Toxostoma curvirostre palmeri (Ridg.).

Opodepe. Nelson has separated the bird of southern Sonora, type locality Alamos, as *T. c. maculatus* (Auk, vol. XVII, 1900, p. 269). We can not detect any differences in the birds taken by Brown from Guaymas north to Opodepe, and Arizona specimens, and believe they should all go with the northern form.

Sialia sialis azurea (Baird).

La Chumata.

Polioptila cærulea obscura Ridg.

La Chumata.

Polioptila plumbea (Baird).

Opodepe.

Heleodytes brunneicapillus brunneicapillus (Lafr.).

Opodepe.

Thryomanes bewickii eremophilus Oberh.

La Chumata.

Catherpes mexicanus polioptilus Oberh.

La Chumata

Sitta carolinensis nelsoni Mearns.

La Chumata.

Baeolophus wollweberi annexus (Cass.).

La Chumata.

Auriparus flaviceps flaviceps (Sund.).

Opodepe.

Psaltriparus plumbeus cecaumenorum subsp. nov.

La Chumata, eight adults of both sexes.

Type from La Chumata mine, north central Sonora, 4,500 feet altitude, adult ♂ No. 14,724, collection of E. A. and O. Bangs. Collected May 22, 1905, by W. W. Brown, Jr.

Characters.—Slightly smaller than true *P. plumbeus* Baird of Arizona; upperparts blue-gray (olive-gray in true *P. plumbeus*); whole head and underparts much paler.

Remarks.—This is a well marked southern form of *P. plumbeus*. Mr. Oberholser kindly compared our eight skins with the large series at Washington, and agrees with us as to its distinctness.

MEASUREMENTS.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Culmen.
14,724	♂ ad.	La Chumata	50.5	52	16.2	7
14,725	♂ ad.	"	47.5	51	16	7
14,726	♂ ad.	"	48	51.5	16	6.8
14,727	♂ ad.	"	48.5	49	16.4	6.8
	♂ ad.	"	49	51	16.2	6.4
14,728	♀ ad.	"	48.5	52	16	7
14,729	♀ ad.	"	49	52.5	16	7
	♀ ad.	"	48	50	16	6.6

Aphelocoma sieberii arizonæ (Ridg.).

La Chumata.

Lanius ludovicianus excubitorides (Swains.).

Opodepe.

Vireo huttoni stephensi Brewster.

La Chumata.

Vireo bellii arizonæ Ridg.

Opodepe.

Phainopepla nitens (Swains.).

Opodepe.

Stelgidopteryx ruficollis serripennis (Aud.).

Opodepe.

Hirundo erythrogastra Bodd.

Opodepe.

Compsothlypis pitiayumi pulchra (Brewst.).

La Chumata.

Setophaga picta picta (Swains.).

La Chumata.

Tangavius* aeneus aeneus (Wagler).

Opodepe.

Molothrus ater obscurus (Gmel.).

Opodepe; La Chumata.

Scolecophagus cyanocephalus (Wagler).

Opodepe. As these specimens were taken at the very end of April and none were seen in May, they most likely were migrants.

Icterus wagleri Scl.

Opodepe.

Icterus cucullatus nelsoni Ridg.

Opodepe; La Chumata.

Icterus parisorum Bp.

La Chumata.

Piranga rubra cooperi Ridg.

Opodepe; La Chumata.

Piranga hepatica Swains.

La Chumata.

Astragalinus psaltria hesperophilus Oberh.

Opodepe; La Chumata.

Carpodacus mexicanus ruberrimus Ridg.

Opodepe; La Chumata. This series represents a form clearly intermediate between *C. m. frontalis* (Say) and the so-called *C. m. sonoriensis* Ridg. of southern Sonora. Brewster, in "Birds of the Cape Region of Lower California," † has shown that the latter is not sufficiently different from *C. m. ruberrimus* of Cape St. Lucas to stand as a subspecies. It is always unpleasant to have to decide by what name to call an intergrade, and in this very instance other ornithologists might not agree with us. We have decided to call the specimens *ruberrimus* because they agree in measurements with a series of that form taken by Brown at Guaymas. In color the adult males are perhaps rather nearer *frontalis*, but there is much individual variation in both series.

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* For use of *Tangavius* in place of *Callothrus*, Cf. Nelson, Proc. Biol. Soc. Washington, Vol. XVIII, p. 125, Apr. 18, 1905.

† Bull. Mus. Comp. Zoöl. Vol. XLI, pp. 133–135, Sept., 1902.

Aimophila quinquestriata (Scl.).

Opodepe.

Aimophila carpalis (Coues).

Opodepe.

Aimophila mcleodii Brewster.

La Chumata.

Aimophila ruficeps scottii (Sennett).

La Chumata.

Amphispiza bilineata deserticola Ridg.

Opodepe.

Spizella pallida (Swains.).

Opodepe. Not taken after the end of April.

Spizella breweri Cassin.

Opodepe. One ♀ only, taken April 28.

Zonotrichia leucophrys leucophrys (Forster).

Opodepe.

Pipilo fuscus intermedius Nelson.

Opodepe. The examples taken appear to be perfectly typical, agreeing with specimens from Alamos and Guaymas, and are not as might be expected intergrades between *intermedius* and *mesoleucus*.

Zamelodia melanocephala (Swains.).

Opodepe; La Chumata.

Pyrrhuloxia sinuata sinuata Bp.

Opodepe.

Cardinalis cardinalis affinis Nelson.

Opodepe; La Chumata. Birds from this region have the bill exactly similar to those from Guaymas and Alamos, at once distinguishing them from *C. c. superbus* or *C. c. igneus*. The only approach they show to *C. c. superbus* is that they are a trifle larger than examples from farther south—Alamos and Guaymas.

VOL. XIX, PP. 23-24 FEBRUARY 26, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW BOTRYCHIUM FROM ALABAMA.

BY WILLIAM R. MAXON.

By permission of the Secretary of the Smithsonian Institution.

Through the courtesy of Mr. W. C. Dukes of Mobile, Alabama, the U. S. National Herbarium has received within the last year an excellent series of an unusually interesting Botrychium, from the vicinity of Mobile, which is apparently undescribed. The writer's views as to the propriety of recognizing the various well-marked component forms of the *ternatum* group as full species, in those instances in which intermediates are not known, were expressed at some length* less than a year ago and need not be repeated. The present form, whose relationship will be discussed below, may appropriately be known as

Botrychium Alabamense sp. nov.

A slender delicate plant of the *ternatum* group, 20–30 cm. high, branching at or above the surface of the ground. Stem 2–3.5 cm. long, 2–3 mm. in diameter, pale or salmon-colored, clothed below with a fibrous sheath and emitting numerous stout spreading roots. Sterile division bright green, short- or frequently long-petiolate (average 2.5 cm.), about 12 cm. broad by 11 cm. long, fully tripinnate, or quadripinnatifid as to the basal portion of the lowermost lateral divisions, variable in outline but commonly subpentagonal, the lateral divisions usually alternate; ultimate segments (in normal mature plants) approximate, or somewhat distant, alternate, oblique, broadly obovate, 5–10 mm. broad, subequally and strongly cuneate to a narrow adnate base, rarely with a shallow lateral lobe; margins unequally and conspicuously fimbriate, particularly in the larger specimens; texture thin, flaccid, the veins readily perceptible. Sporophyll averaging 22 cm. in length, slender, often arcuate or even flexuose, uniformly of a decided salmon color (excepting the apical third) as are also the main vascular parts of the sterile division; panicle 7–10 cm. long, bipinnate or rarely tripinnate, basal branch averaging 3.5 cm. in length.

Known to the writer only from the vicinity of Mobile, Alabama, and chiefly through a fine series collected by Mr. Dukes at Spring Hill, at an

*A New Botrychium from Jamaica.—Bull. Torrey Club **32**: 219-222. 1905.

elevation of 200 feet, some six or seven miles west of that city. Of these specimens, No. 510,782, U. S. National Herbarium, collected in August, 1905, is designated as type. The only other material seen is a single sheet of small plants collected somewhere in the vicinity of Mobile by the late Dr. Chas. Mohr, who regarded them as "an ambiguous form" which he was unable to place with certainty.

The following note on habitat is kindly contributed by Mr. Dukes:

"Nearly all the material of this plant [*B. Alabamense*] has been found at Spring Hill. * * * The few isolated plants so far found at lower elevations were small and nearly always misshapen. The best specimens are invariably found in open thickets under the shelter of cedars and yaupon trees or along yaupon hedges at the edges of old abandoned fields and pastures. Like all the Botrychia in this section it is found in colonies of from two or three to often as many as fifty or more. * * * It puts up its new frond after the late summer rains, towards the middle of August, at about the same time as *B. tenuifolium*, and is often found growing in close proximity to the latter; indeed, you seldom find one without finding the other also. The fruiting fronds develop ordinarily from the middle of September to the first of October but vary several weeks according to weather conditions; during dry seasons they are late in appearing."

The present form stands somewhat between *B. obliquum* and *B. biternatum*. From the former, which in a typical state is apparently altogether wanting from Alabama, it differs conspicuously in its lax habit, usually longer-stalked divisions and short rounded segments. From the latter species, which is well known for its unique seasonal character (*i. e.* fruiting in early spring), it departs otherwise in the greater size of all its parts, its non-prostrate habit, decidedly thinner texture and less divaricate branching. In a way, however, dwarfed plants of *B. Alabamense* and uncommonly robust specimens of *B. biternatum* simulate each other rather closely and offer a possible suggestion as to the origin of the latter. Further discussion of their relationship may well be deferred until the publication of a paper which Mr. Dukes has prepared, descriptive of *B. biternatum* as it occurs in Alabama, with particular reference to its peculiar seasonal appearance. But whatever their phylogeny may have been it appears scarcely open to question that the two are at the present time specifically distinct.

Incidentally it may be mentioned that the plants to which Mr. Dukes refers as *B. tenuifolium* are much larger than those originally described by Professor Underwood and not altogether typical in cutting.

Vol. XIX, pp. 25-28 February 26, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW CARNIVORES FROM THE MALAY PENINSULA.

BY GERRIT S. MILLER, JR.

Among the mammals collected by Dr. W. L. Abbott on the Malay Peninsula and presented to the United States National Museum are the following carnivores, neither of which appears to have been hitherto described.

Arctogalidia major sp. nov.

Type.—Young adult male* (skin and skull), No. 83,510, United States National Museum. Collected in Trong, Lower Siam, September 3, 1896, by Dr. W. L. Abbott.

Characters.—A black-eared, heavily striped animal like the Bornean *Arctogalidia stigmatica*, but differing from this species as well as from the white-eared, indistinctly striped *A. leucotis* of the Malay Peninsula, in its larger size; basilar length of skull about 110 mm. instead of about 95–105 mm.

Color.—General color a light broccoli-brown, with a silvery gloss on back and a distinct wash of ochraceous-buff on sides of body and outer surface of legs, this wash particularly noticeable on neck. Underparts dull, grayish ochraceous-buff. Ears, feet, and terminal half of tail black. Muzzle and a distinct area behind and above ear black. Crown and cheeks a clear grizzled gray contrasting slightly with more yellowish neck. Dorsal stripes clear black and well defined, the lateral extending forward to dark area behind ear. Basal half of tail like back, but crossed by faint though evident blackish transverse bands nearly 10 mm. wide. Ten of these bands can be counted; they then become confused and crowded, merging quickly into black terminal area.

Skull and Teeth.—As compared with that of a slightly older male *Arctogalidia stigmatica* from near Sandakan, Borneo, the skull differs in its noticeably more robust form. Although only about 3.5 mm. more in greatest

* Permanent dentition in place but unworn; sutures of rostrum and braincase plainly visible.

length the skull of *Arctogalidia major* exceeds that of *A. stigmatica* by 3 mm. in greatest breadth of rostrum and by 5 mm. in mastoid breadth. The audital bullæ are relatively larger in the larger animal, their greatest length, including paroccipital process, 23.4 mm. instead of 19.6 mm. As compared with that of *Arctogalidia leucotis* the skull shows much the same differences, though even more noticeably (see cranial measurements). The teeth show no special peculiarities, though they appear to be relatively smaller than in *A. stigmatica*.

Measurements.—External measurements of type: Total length, 1245; head and body, 560; tail vertebræ, 685; hind foot, 97 (92). Skull: Greatest length, 118 (105)*; upper length, 107 (95); condylobasilar length, 114 (101.4); basilar length, 109 (96); palatilar length, 62.6 (58); breadth of palate between carnassials, 17 (15.4); breadth of posterior extension of palate, 12.2 (9); breadth of rostrum across roots of canines, 21.8 (19.4); constriction in front of postorbital processes, 21.6 (17); constriction behind postorbital processes, 17.2 (17); breadth of braincase above roots of zygomata, 35, (36.2); mastoid breadth, 42.8 (37); mandible, 86.6 (80.4); maxillary toothrow exclusive of incisors, 41 (37); upper incisor row, 10 (8.6); mandibular toothrow exclusive of incisors, 45 (40).

Specimens examined.—One, the type.

Remarks.—This species appears to be a large continental representative of the widely distributed *Arctogalidia stigmatica* group. It is the largest known member of the genus, and the size of its skull is alone sufficient to distinguish it. From the other species occurring on the Malay Peninsula, *A. leucotis*, it is separable by color as well as by size, as the ears show no tendency to develop the conspicuous white patch on distal half, and the dorsal streaks retain their outline complete.

Paradoxurus robustus sp. nov.

Type.—Adult female (skin and skull) No. 86,796, United States National Museum. Collected in Trong, Lower Siam, February 13, 1899, by Dr. W. L. Abbott.

Characters.—Like *Paradoxurus leucomystax* from the southern part of the Malay Peninsula,† but size not as great, and color not as dark.

Color.—Type: Upperparts a light dull buff, paler and clearer on sides, somewhat tinged with russet over middle of back, the hairs everywhere black-tipped, but the dark color very inconspicuous except on crown, neck, and shoulders, where it produces an evident clouding. Back without stripes or spots. Feet and ears blackish. Upper half of cheeks light buff, clearer and more yellow than that of body, fading into buffy gray on forehead and median line of muzzle. Sides of muzzle and lower half of cheeks to and including eyes dark hair-brown, slightly grizzled with grayish buff. Whiskers pale buff. Underparts and inner surface of legs dull buff, paler and less yellow than that of Ridgway, somewhat darkened by a wash of

*Measurements in parenthesis are those of a much older male *Arctogalidia leucotis* from Red Point, Tenasserim (No. 124,227).

† The type of *Paradoxurus leucomystax* formed part of the Raffles collection, and was therefore probably taken in this region or in western Sumatra.

hair-brown on chin and throat. Tail like body, but darkening to a uniform dull, blackish tip.

Skull and Teeth.—Except for the differences in measurements, and a tendency toward greater robustness, the skull and teeth essentially agree with those of *Paradoxurus leucomystax*.

Measurements.—External measurements of type: Head and body, 653; tail vertebræ, 602; hind foot, 100 (96). External measurements of an adult male (No. 124,279) from Telok Besar, Tenasserim: Head and body, 640; tail vertebræ, 565; hind foot, 99 (96). Skull of type: Greatest length, 126 (134) *; upper length, 116; condylobasilar length, 121 (133); basilar length, 116.4 (127); palatilar length, 57 (63); width of palate including molars, 41 (41.4); least width of palate between incisors and canines, 14 (16); interpterygoid space, 27 x 14 (26 x 14.6) breadth of rostrum across roots of canines, 24; zygomatic breadth, 69 (70); constriction in front of postorbital process, 25.4 (28.4); constriction behind postorbital process, 22.4 (22.4); breadth of braincase above roots of zygomata, 41.4 (38); mastoid breadth, 45 (46.8); occipital depth, 30.4 (31.4); mandible, 94 (104); maxillary toothrow exclusive of incisors, 44 (46); mandibular toothrow exclusive of incisors, 50 (51).

Specimens examined.—Four, two from Trong, Lower Siam, and two from Telok Besar, Tenasserim.

Remarks.—An immature male from Champang, Tenasserim (No. 124,021), is not as pale as the others from the same general region, and may, perhaps, represent the dark southern form. As it retains its milk dentition it is too young to be definitely named.

* Measurements in parenthesis are those of a young adult female (teeth slightly worn, nasals distinct except posteriorly) *P. leucomystax* from Perak, Brit. Mus. No. 0. 2. 4. 3.

Vol. XIX, pp. 29-34 February 26, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF NEW BERMUDIAN FISHES.

BY TARLETON H. BEAN.

The Bermuda Expedition of the Field Museum of Natural History in 1905 obtained about 165 species of fishes of which the following appear to be undescribed :

Iridio meyeri.

The type of the species is 4 inches long to caudal base. Collector's number 1101 ; Field Museum catalogue number 5496; locality, Nonsuch Id. Named for Capt. W. E. Meyer, of St. George's.

D. IX, 11 ; A. III, 11 ; scales, 3-27-9.

Head $3\frac{1}{2}$ in total without caudal; depth about 4 ; eye 5 and snout $3\frac{1}{2}$ in head. Anterior profile of head strongly convex, mouth on level with lower axil of pectoral. Opercular flap broad, its width and length equal, $4\frac{1}{2}$ in head. Two canines in the front of each jaw projecting almost straight forward.

Four rows of scales in front of dorsal, not meeting on median line; scales on nape rudimentary. Lateral line begins in fifth vertical row of scales, curves upward to third row under eighth ray of soft dorsal, thence sharply down to median line, its straight portion piercing 6 scales. Anal base as long as head. Pectoral reaches to eighth scale of lateral line, not quite to vent. Ventral equal to post-orbital part of head.

Body in spirits: Dusky above, pale below. A brown band from snout continued behind eye to caudal ; an obscure, narrow, interrupted band below this. A dark blotch on membrane between fifth and sixth dorsal spines and one between sixth and seventh. A minute dark spot at base of last dorsal ray. A small dark blotch on upper axil of pectoral. A narrow dusky bar across interorbital space and two similar bands on nape. A narrow white streak from angle of mouth to upper axil of pectoral; a second whitish streak from mandibular articulation across preopercle and subopercle. Eleven narrow, interrupted, oblique, whitish streaks on pectoral region extending back past anal origin.

Iridio decoratus.

Two type specimens. Cellector's number 545; Museum catalogue number 5128; locality, Nonsuch Id., October 4, 1905.

D. IX, 11 ; A. III, 12; scales, 2-27-7.

Eye equal to snout, 4 in head; head $3\frac{1}{2}$ in total to end of scales; depth $4\frac{1}{3}$. The pectoral reaches to eighth row of scales; ventral about one-half head, not reaching nearly to vent.

Color in spirits: Brownish above middle line, paler below; a short dark stripe on snout in front of eye; a narrow dark line from eye backward to nape; a second irregular line also from eye below this, and a third broken line beginning behind eye and running toward origin of lateral line; a small black dot in upper axil of pectoral.

Iridio elegans.

Four type specimens. Collector's numbers 703, 762, 767; Museum catalogue numbers 5129, 5130, 5131. Castle Harbor at Nonsuch Id. and Cooper's Id.

D. IX, 11; A. III, 12; scales, $2\frac{1}{2}$–26–9.

Eye $1\frac{1}{2}$ in snout, 4 in head. Head $3\frac{1}{4}$ in total to end of scales. Depth equal to head. Pectoral extends to tenth scale of transverse series; ventral $\frac{1}{2}$ head, not quite reaching vent.

Colors in spirits: A narrow blue line from angle of mouth to edge of subopercle; a wavy blue line starts near angle of mouth, runs under eye and gently down toward upper axil of pectoral; spots and broken lines of blue behind eye and on nape; five pale bars from edge of back downward toward median line; a large, diffuse black blotch on anterior half of soft dorsal extending downward to lateral line; two smaller dark blotches under last four dorsal rays; an irregular dark blotch on root of caudal; three blue lines on body, the uppermost along lateral line, the others below median line; three short, oblique blue lines in pectoral region.

Iridio microstomus.

A small individual, $1\frac{1}{2}$ inches to base of caudal. Collector's number 541; Museum catalogue number 5138; belongs to the same group with *I. meyeri*, having only two canines, projecting forward, in each jaw.

D. IX, 11; A. III, 11; scales, 3–27–9.

Mouth small, lips broad, covering the teeth. Maxilla scarcely reaching front of eye. Head $3\frac{1}{2}$, depth nearly 4 in total without caudal. Eye $3\frac{1}{2}$ in head. Pectoral reaches to eighth scale of lateral line, ventral nearly as far, but not nearly to vent.

In spirits: A dark band from snout to eye and from eye to caudal; a small dark spot at base of last dorsal ray and in upper axil of pectoral; a narrow silvery streak limiting the lateral band above and meeting its fellow of the opposite side in a V shape on top of snout. Back pale lemon overlaid with dusky points; below lateral band pale lemon yellow, lower half of head and the abdominal region silvery; caudal tinged with orange and with an intense band of orange at base; iris dusky, overlying pink and silver.

Labrisomus lentiginosus.

Type $4\frac{1}{2}$ inches without caudal. Collector's number 500; Museum catalogue number 5142; locality, tide pool at Doe's Rock, Paget Parish. October 26,1905.

Head about 3, depth 4 in length to caudal. Pectoral reaches to vertical through anal origin; ventral $\frac{1}{2}$ head; reaching scarcely more than half way to vent; eye equals snout; $4\frac{1}{2}$ in head.

In spirits: Pale yellow, sides with four or five faint, irregular, dull gray cross bands; head profusely sprinkled with minute dark points; pectoral with six or seven narrow, interrupted bands formed by dots on the rays; caudal with six similar bands; no dark spot on front of spinous dorsal and none on opercle; soft dorsal and pale mottled with darker but without evident bands.

Antennarius verrucosus.

Type specimen, $3\frac{3}{4}$ inches long without caudal. Collector's number 928; Museum catalogue number 4853; was taken in the Reach, St. George's Id., in 1904.

D. III, 12; A. 7; V. 6; P. 10.

First dorsal spine extends to base of third spine; "bait" absent; second spine free; third spine recumbent, adnate to skin of back. Second spine 3 in upper jaw; third spine twice as long as second. Body and fins everywhere rough with small prickles; many roundish raised clusters of spinules forming elevations on sides, back and belly in front of ventrals.

Upper jaw equals distance from pectoral to vent; eye 6 in upper jaw, 4 in interorbital space.

Color in spirits, pale yellowish; inside of mouth whitish; brownish dots and lines on head and body; four small, roundish, ocellated dark spots on soft dorsal; a diffuse dusky blotch on soft dorsal rays extending down on back enclosing a darker nucleus of irregular shape; caudal of left side with ten small irregular dark spots and a few smaller ones; an ocellated, oblong, dark spot on anal and several much smaller spots; about eight small dark spots at bases of pectoral rays; a dusky patch under each pectoral as long as upper jaw, its width one-third of its length; a smaller, diffuse blotch in front of vent.

Holocentrus meeki.

A small-scaled *Holocentrus* differing from *ascensionis* in its short dorsal and anal rays, small eye, equal caudal lobes and other characters. Types, collector's number 144, Museum catalogue number 5079, are $2\frac{3}{4}$ inches and 3 inches long respectively, without caudal.

D. XI, 14 to 15; A. IV, 10; scales 4–54 to 55–7.

Head, $3\frac{1}{2}$ in total without caudal; depth, 4; eye, $3\frac{1}{2}$ in head; maxilla to vertical through front of eye; pectoral, $\frac{3}{5}$ head, reaching sixteenth series of scales; ventral, $\frac{2}{3}$ head, ending far from vent; anal base, 2 in head, equal to longest dorsal spine, and to longest soft ray; third anal spine 3 in head, longer and stouter than fourth.

In spirits, pale brown above lateral line, shining silvery below; all of head but top silvery; caudal peduncle purplish; membrane of spinous dorsal blackish; iris pale.

Named for Dr. Seth E. Meek, Assistant Curator of Zoology, Field Museum of Natural History.

Cryptotomus crassiceps.

Two specimens, $3\frac{3}{4}$ inches and $4\frac{3}{4}$ inches long to end of scales, collector's number 417, Museum catalogue number 4964; Cooper's Id., September 26, 1905.

D. IX, 10 to 11; A. II to III, 9; scales, $1\frac{1}{2}$–25–6.

No posterior canine tooth; in the smaller example about 12 teeth in front of upper jaw developed as canines, the two outer of which are hooked and recurved; side teeth coalesced into a cutting edge; in the larger examples there are fewer anterior canines and two of them project straight forward.

Scales on breast and belly notably enlarged; last scale of lateral line enlarged and produced backward into a point. Width of head $\frac{1}{2}$ its length; snout pointed, subconical, 7 in total to end of scales; eye 2 in snout; mouth small, horizontal, its angle not reaching to front of eye; upper lip double, closely concealing the jaw. Three scales on median line in front of ventral; four across median line in front of dorsal.

Depth $3\frac{3}{4}$ in total to end of scales; snout 3 in head. Pectoral more than $\frac{1}{2}$ head, reaching eighth scale of lateral line; ventral equal to snout, not nearly reaching to vent; caudal short, sub-truncate, about 3 in head.

In spirits, grayish brown above, pale below; all fins pale except caudal which shows about 6 narrow, dusky cross bars in the smaller example; a black blotch at upper axil of pectoral and above it a faint blue line; isthmus dusky; two narrow blue lines from eye to angle of mouth; iris pale yellow, blackish at top, crossed obliquely by a blue line; dusky color on sides forming broken lines on 3 or 4 rows of scales below lateral line.

Eupomacentrus chrysus.

Type specimen $1\frac{5}{8}$ inches long to end of scales, collector's number 525, Museum catalogue number 5025, from White's Flat Channel, October 6, 1905. This is almost uniform yellow, the only dark portions being the eye, a diffuse spot on the base of the spinous and soft dorsal covering five rows of scales, extending to lateral line, a dark saddle on top of caudal peduncle, a minute dark point on upper axil of pectoral, a faint dusky area on snout and nape, and about 21 very faint, narrow, dusky lines on sides, some extending above lateral line but none reaching far below edge of pectoral.

D. XII, 16; A. II, 15; scales, 3–28–11, pores on 18 scales.

Depth 2 in total to end of scales; head, $3\frac{1}{3}$; eye, $2\frac{1}{2}$ in head; interorbital space, 3 in head. Dorsal spines regularly graduated, the last about $\frac{2}{3}$ head. Pectoral reaches to twelfth row of scales; ventral filamentous at tip and reaching anal origin.

Hippocampus brunneus.

Type, collector's number 1099, Museum catalogue number 5494, an adult male, taken at Long Bird Id., August 29, 1904.

D. 18, on 3+1 rings; rings 11+35.

Eye, $2\frac{1}{2}$ in snout, 6 in head; head equal to body; depth about $\frac{3}{4}$ head. Dorsal base equal to snout; longest dorsal ray 2 in snout.

Chocolate in spirits; a triangular whitish blotch immediately behind head, its greatest width 2 in snout; a larger whitish blotch, almost hour-glass shaped, on body, chiefly on sixth and seventh body rings, extending entirely around; eight narrow whitish bands across back, the first at the middle of dorsal base, none of these reaching below median line. Color notes on *H. hudsonius* in Bull. 47, U. S. N. M., 777, may relate to *H. bruneus*, but not to *H. hudsonius* DeKay.

Monacanthus tuckeri.

Type specimens, collector's numbers 100, 121, 376, Museum catalogue numbers 5183, 5184, 5186, taken at the Flatts, Well Bay, and Long Bay (Somerset).

D. 35; A. 34 to 36. In shape resembling young *Alutera*. Head 3 in total without caudal; depth at anal origin equal to head; least depth of caudal peduncle $2\frac{1}{3}$ in snout; eye $2\frac{1}{2}$ in snout, 3 in head. First dorsal spine nearly $\frac{1}{4}$ total without caudal, with two rows of strong barbs; second dorsal spine as long as the eye.

Color in spirits, dark brown; an irregular white pseudo-band on under surface of head extending on body to over middle of anal base; in the largest example this marking resembles hieroglyphics; four narrow, dark bands on first dorsal spine and four on caudal fin.

Dedicated to the venerable George Tucker, M. A., archdeacon of Bermuda, for his devotion to biological science in the colony.

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Vol. XIX, pp. 35-40 February 26, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

PLANTAE MONTROSENSIS.

I.

BY AVEN NELSON AND P. B. KENNEDY.

This first paper dealing with the plants of Mount Rose represents joint authorship, as shown above, in so far as the study of the material and the specific descriptions are concerned. The field work and the notes are all by the junior author, who spent two weeks of the summer of 1905 on Mount Rose studying and collecting its flora. This mountain is especially interesting from a botanical standpoint as it is a high spur of the Sierra Nevada Mountains strongly influenced by the dry atmospheric conditions existing on the eastern side. It may be taken as intermediate between the typical high mountains of the Sierras and those of the interior of the Great Basin. It is proposed to make an extensive ecological study of the flora of this mountain. The following new species were discovered while studying the first lot of material, all of which was collected between 10,000 feet elevation and the summit, which is 10,800 feet.

Eriogonum rhodanthum sp. nov.

Perennial, acaulescent, very low, caespitose, densely tomentose; the caudex made up of many strands twisted together like a rope, its numerous branches terminated by clusters of very small, new and old leaves: leaves 7 mm. long or less with petioles about 4 mm. long, tomentose on both sides, ovate to suborbicular: scapes very slender, from 12 mm.–5 cm. high, dark-red, covered with a loose white tomentum, and terminating in a flower cluster about 12 mm. across: involucres 2 mm. long, about 5, each with 8 densely tomentose, linear lobes: perianth rose-colored, 3 mm. long, its lobes broadly obovate, glabrous, with a single strong brown vein: pedicels 3 mm. long; filaments 1 mm. long, villous below: ovary glabrous.

It forms dense mats from 1–6 dm. across, on hard rocky ground. Summit of Mount Rose, Washoe County, Nevada, elevation 10,800 feet, No. 1184 (type), August 17, 1905, P. B. Kennedy.

Allied to *E. anemophilum* Greene, but different in the character of the caudex, foliage, and color of the flowers.

Eriogonum rosensis sp. nov.

Perennial, acaulescent, woolly-tomentose, caudex branched and covered with numerous (new and old) persistent leaves: leaves 6–12 mm. long, ovate, tapering to a petiole 4 mm. long, woolly-tomentose on both sides: scapes 1–several from each branch of the caudex, rather stout, minutely glandular-pubescent, 2–5 cm. high, each bearing a cluster of about 8 involucres: involucres tomentose, 8-lobed, 3 mm. long, each containing about 16 flowers; the pedicels 3 mm. long: perianths yellow, sometimes slightly tinged with red, 2 mm. long: lobes obovate, glabrous, with a peculiar swelling at the apex of each lobe: filaments about 2 mm. long, villous below: ovary glabrous, 3-winged.

Allied to *E. anemophilum* Greene: collected on the summit of Mount Rose, Washoe County, Nevada, elevation 10,800 feet, August 17, 1905, No. 1180 (type), P. B. Kennedy.

The plant forms dense, low, mats about 15 cm. across, growing where it can find a little soil among the lava rocks.

Arabis depauperata sp. nov.

Perennial, about 8 cm. high in flower, considerably taller in mature fruit: root branched 2–3 cm. below the surface of the ground into a number of long, slender, wiry rootlets: stems many, very slender, from a much branched caudex; stems and leaves covered with a minute, stellate, pubescence; the numerous lower leaves small and tufted at the base of the stems, petioled, the upper cauline, sessile, 6–10 mm. long, ovate-lanceolate, entire: racemes 3 cm. or less long, bearing minute purple flowers, 3 mm. long; calyx lobes oblong, 2 mm. long; corolla lobes spatulate, rounded at the apex, and attenuate towards the base, 3 mm. long: mature pods 3–6 cm. long and 2 mm. wide, glabrous, purplish, with minute gray dots, mostly straight, though sometimes slightly curved; pedicels 4–6 mm. long: seeds flattish, orbicular, orange, 2 mm. wide, with an even yellowish-green very narrow winged margin extending completely around the seed.

Nearest to *A. platysperma* Gray, but quite different in the character of the whole plant, size of leaves, pods, seeds, etc.

Summit of Mount Rose, Washoe County, Nevada, elevation 10,800 feet, August 17, 1905, No. 1167 (type), P. B. Kennedy.

Ribes Churchii sp. nov.

Shrub 3–6 m. high, dense, unarmed; old branches ash-gray, new ones light brown: leaves densely viscid-glandular on both sides, 6–12 mm. broad, sub-orbicular, 3-lobed, crenate: petioles 6–20 mm. long, glandular: inflorescence 1–2-flowered, rarely 3-flowered; peduncles 12 mm. long; pedicels 1 mm. long or less: flowers subtended by 3 bracteoles which are ovate, and entire, or occasionally 3-toothed at the apex; calyx white,

shading to pink, 6–10 mm. long, sparsely beset with gland-tipped hairs, its lobes ovate, obtuse, reflexed, 2 mm. long; petals deltoid-reniform, 1 mm. long; stamens equalling the petals: berry viscid, red, not juicy, insipid, 10–14 seeded, ripening in September.

Type collected at the base of the Sierra Club monument at the summit of Mount Rose, Washoe County, Nevada: elevation 10,800 feet, being No. 1160, August 17, 1905, P. B. Kennedy.

Allied to *R. cereum* Dougl. but much smaller in regard to size of bush, leaves, and flowers, and much more viscid. The branches are extremely short and rigid. The berry in *R. cereum* is described as rarely containing more than 3 large seeds, while this has numerous, small, angular seeds.

Named in honor of Professor J. E. Church, Jr., who has ascended Mount Rose many, many times, both in the heat of summer and the heavy snows of winter, and to whom we are indebted for excellent specimens containing the ripe berries.

Gilia montana sp. nov.

Perennial, depressed-caespitose, with a stout lignescent caudex: flowers capitate: leaves crowded on short tufted shoots, floccose-tomentose, mostly 5-lobed, a few at the base linear, bilobed, and trilobed; lobes linear-lanceolate, slightly pungent, 4–6 mm. long, with petioles about 6 mm. long, bearing a few scattered bracts, similar to the leaves: numerous purplish lobed bracts among the flowers: flowers numerous, white to pink, clusters 12–25 mm. across; calyx very slender, beset with long, slender hairs 4 mm. long, about equalling the tube of the corolla, calyx lobes linear-lanceolate, slender-subulate: each flower subtended by a linear-lanceolate bracteole; corrolla 6 mm. long, tube about twice the length of the ovate rounded entire lobes: capsule ovoid, glabrous, 2 mm. long, one-seeded.

Allied to *G. caesoitosa* (Gray) A. Nels.; Summit of Mount Rose, Washoe County, Nevada, August 17, 1905, No. 1170 (type), P. B. Kennedy, at 10,800 feet; also from the same place, but past flowering, September 29, 1902, No. 694, P. B. Kennedy; also from Tinkers Knob, Eldorado County, California, Sierra Nevada, elevation 9,020 feet, August 10, 1901, P. B. Kennedy and S. B. Doten, No. 279.

Phlox dejecta sp. nov.

Plant resembling a desert moss: tufts less than 3 cm. high: branches of the caudex somewhat tortuous: leaves linear, mucronulate, hirsute to pubescent, 4–6 mm. long, imbricated: corolla white, the tube twice as long as the calyx; corolla-tube 12 mm. long; calyx teeth prominent, rigid, hirsute, 5 mm. long, linear-lanceolate, with a very sharp spinulose tip: capsule ovoid, glabrous, 3 mm. long, one-seeded.

Allied to *P. bryoides* Nutt. and *P. muscoides* Nutt., but in no sense lanate or canescent, with a very different calyx and corolla. Growing abundantly in broad moss-like mats on the summit of Mount Rose, Washoe County, Nevada, at 10,800 feet, August 17, 1905, No. 1159 (type), P. B. Kennedy.

Castilleia inconspicua sp. nov.

Perennial, with a caudex about 5 cm. long, which branches at the base into several roots: plants variable in height according to the elevation: At 10,000 feet about 15 cm. high, becoming gradually reduced to 5 cm. or even less at 10,800: stems and leaves pubescent and glandular, which increases in density with the elevation: leaves sessile, mostly linear at the base, becoming 3–7 cleft or parted toward the inflorescence, very variable in size, from 6–25 mm. in length: bracts subtending each flower 3-cleft to about the middle, 12–20 mm. long; flowers in an oblong spike, cream-colored, with a purple blotch; calyx villous, 12 mm. long, divided into 4 lanceolate-acuminate lobes 4–6 mm. long, greenish-purple; corolla 10 mm. long, galea triangular, obtuse, gibbous, slightly exceeding the lip which has 3 obtuse, rounded lobes, less than 2 mm. long: stigmas capitate, 2-lobed, slightly exceeding the galea; capsule glabrous, 8 mm. long, about 40-seeded.

Allied to *C. rubida* Piper.

Summit of Mount Rose, Washoe County, Nevada, No. 1169 (type), August 17, 1905, P. B. Kennedy, at 10,800 feet; also No. 1144 of same place and date, but at 10,000 feet.

Hulsea caespitosa sp. nov.

Plant about 3 dm. high, forming tufts a third of a meter across: densely pubescent, and strongly viscid-glandular, emitting a disagreeable odor; the involucre only lanate: perennial, deep rooted, branching several times: divisions of the caudex terminated above ground by several leafy branches; around the base of each branch persist the brown, dried up petioles of the previous year's growth, appearing like scales: radical leaves from 4–8 mm. long, lacerate-dentate above, much constricted and entire at the middle, and expanding into a broad light-colored sheathing base, 8–10 mm. wide: flowering stems leafy, usually one from the center of each tuft of leaves, the cauline leaves gradually becoming smaller towards the head: head $2\frac{1}{2}$ cm. or more across, orange-yellow, involucre lanate, of numerous bracts, in 3 ranks; outer, oblong, 10 mm. long; inner, a little longer, attenuate-acute, with rather long, gland-tipped hairs towards the apex; ray flowers about 30; ligulate corolla about 12 mm. long, with gland-tipped hairs below, apex variable, unequally 3-lobed; disk flowers glandular, 7 mm. long, with 5 equal lobes; palae very small, less than 1 mm. long, fimbriate: achene 6 mm. long, covered with villous hairs which partly obscure the palae.

Allied to *H. nana Larseni* Gray and *H. algida* Gray.

Summit of Mount Rose, Washoe County, Nevada, at 10,800 feet; in pockets of soil among loose volcanic rocks, No. 1158 (type), August 17, 1905, P. B. Kennedy.

Raillardella Nevadensis sp. nov.

Rootstocks very stout for the size of the plant; extensively creeping: leaves glandular on both sides, 12–24 mm. long, oblanceolate, entire: scape 2–8 cm. high; peduncle and involucre viscid-glandular, much more so

than the leaves; head about 16-flowered, 2 cm. long; involucre narrowly campanulate; bracts linear-lanceolate, 12 mm. long, slightly held together by the glandular hairs on the margins: flowers orange-yellow, no rays; pappus-bristles about 18, short plumose, white, 8 mm. long: achene black, about 6 mm. long, narrowly oblong.

Allied to *R. scaposa* Gray: abundant in loose granitic soil on Mount Rose, Washoe County, Nevada at 10,000 feet, No. 1147 (type), August 17, 1905, P. B. Kennedy.

Chrysothamnus monocephala.

Very low, about 3 dm., shrubby; branches short and rigid: stems and leaves covered with a fine, short, close tomentum; the young, new shoots very densely so, appearing white, the others dark gray: leaves linear, the longest about 18 mm., 1-nerved, mucronate, the upper ones sometimes exceeding the inflorescence, and gradually merging into the involucral bracts: heads mostly solitary, terminal, 5–6 flowered; bracts about 10, rigid, imbricated in two equal ranks, usually 1-nerved, outer ones keeled, 8–10 mm. long, broadly lanceolate, with a prominent acuminate cusp, yellowish, striped or mottled with purple; covered with loose cobwebby hairs: pappus-bristles numerous, of unequal lengths, the longest about 8 mm., very minutely villous, light-yellow; corolla 9 mm. long; achene densely silky-villous, 3 mm. long.

Allied to *C. Nevadensis* (Gray) Greene, but leaves not oblanceolate or 3-nerved; involucral bracts not 5-ranked, and tips not recurved.

Summit of Mount Rose, Washoe County, Nevada, August 17, 1905, No. 1171 (type), at 10,800 feet; also No. 697 from same place, but at 10,000 feet, September 29, 1902, P. B. Kennedy.

Vol. XIX, pp. 41-48 February 26, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

MAR 13 1906

GENERAL NOTES.

A NEW NAME FOR *RHINOLOPHUS MINUTUS* MILLER.

Rhinolophus minutus, the name which I proposed in 1900* for a bat from the Anambas Islands, has recently been shown by Mr. Knud Andersen† to be invalidated by *Vespertilio minutus* Montagu, applied in 1808‡ to the British race of *Rhinolophus hipposideros*. The Anambas animal may therefore be renamed as *Rhinolophus minutillus*.—*Gerrit S. Miller, Jr.*

THE NOMENCLATURE OF THE FLYING-LEMURS.

The flying-lemurs are currently known as *Galeopithecus*, and the family which they form as the *Galeopithecidæ*. Neither name can, however, be retained, since *Galeopithecus* Pallas is twelve years antedated by *Cynocephalus* Boddaert, based on the same animal. Boddaert's name must therefore be adopted for the Malayan flying-lemurs, as its more familiar use for a genus of baboons began nearly thirty years later. A like change in the family name is fortunately obviated by the existence of a second genus containing the Philippine members of the family, a group strikingly differentiated in both cranial and dental characters. Chief among these characters are, *cranial*: the less inflation of the mastoid region; the greater separation of the occipital condyles; the narrower, more distinctly outlined brain-case; and the less broadened and otherwise modified postorbital processes; *dental*: the less specialized structure of the teeth, as shown by the relatively slight distortion of the primitive trigones, those of the posterior lower premolar and first and second lower molars retaining the typical arrangement of the cusps almost unmodified; the great lengthening and thickening of the canines both above and below and of the outer upper incisor, and the complete absence of serrations on the cutting edges of these teeth and of the anterior upper and lower premolar.

The family and its two genera should stand as follows:

Family Colugidæ.

Galeopithecidæ Gray, 1821, and of most subsequent authors.

Genus **Colugo** Gray.

1870. *Colugo* Gray, Catal. Monkeys, Lemurs, and Fruit-eating bats Brit. Mus., p. 98. Type *Galeopithecus philippinensis* Waterhouse.

Genus **Cynocephalus** Boddaert.

1768. *Cynocephalus* Boddaert, Dierkundig Mengelwerk, II, p. 8. Type *Cynocephalus volans* from Ternate.

1780. *Galeopithecus* Pallas, "Acta Acad. Sci. Imp. Petrop., IV, p. 208."

—*Gerrit S. Miller, Jr.*

* Proc. Washington Acad. Sci., II, p, 235. August 20, 1900.

† Proc. Zool. Soc. London, 1905, II, p. 129. October 17, 1905.

‡ Trans. Linn. Soc. London, IX, p. 162.

AN EARLIER NAME FOR *MELOSPIZA LINCOLNII STRIATA*.

The bird described by Mr. William Brewster (Auk, 1889, p. 89) as *Melospiza lincolnii striata* seems to be a recognizable race of *Melospiza lincolnii* from which it differs in smaller size and broader streaking of the upper parts. The original description was based on autumn specimens from Comox, Vancouver Island, British Columbia, but Mr. Joseph Grinnell has recently shown (Auk, 1904, pp. 274–276) that the summer home of the subspecies is the coast region of southeastern Alaska, particularly the vicinity of Sitka and Wrangel.

The name given to this form by Mr. Brewster (*loc. cit.*) is, however, long antedated by at least one other. In a pertinent connection Finsch (Abhandl. Nat. Ver. Bremen, III, 1872, p. 46) cites *Emberiza spinoletta* "Kittlitz" Brandt, Descr. et Icon. Anim. Ross., 1836, pl. II, fig. 7, as a synonym of the Alaskan *Melospiza lincolnii*. This plate seems, however, never legitimately to have been published, as Plate II of the work in question represents *Anser leucopareius* Brandt, and the name *spinoletta* is therefore unavailable for *Melospiza lincolnii striata;* but even had the name been properly published, it would be somewhat doubtfully applicable, since no locality is mentioned, though presumptively this is the neighborhood of Sitka, where Kittlitz is known to have collected.

No such uncertainty, however, attends the name *Emberiza* (*Zonotrichia*) *gracilis* Kittlitz (Denkwurd. Reise Russ. Amer. I, 1858, p. 199), based on two adults taken June 25 and an immature bird of July 15, at Sitka, Alaska, with the following diagnosis: "Die kline, schlanke Gestalt und der aschgraue mit mehreren schwarzen Linien bezeichnete Kopf charakterisert dieselbe." This description, though brief, is sufficiently definite to identify *Melospiza lincolnii striata*, for neither of the only other small breeding sparrows of Sitka—*Melospiza cinerea rufina* and *Passerculus sandwichensis alaudinus*—agrees in characters with the above description given by Kittlitz, while *M. l. striata* does. In *Melospiza c. rufina* the top and sides of the head, with the exception of a dull brownish slate superciliary stripe, are sooty brown, almost uniform, the slightly darker centers of the feathers being only faintly suggestive of streaking. In *Passerculus s. alaudinus*, the head, although much streaked with black, is yellowish or buffy white, not ash gray, as in *Melospiza lincolnii striata*. To be sure, Kittlitz makes no mention of the reddish brown margins of some of the black coronal streaks, but in so brief a description this is scarcely to be expected. In view of these facts it becomes necessary to change the name of *Melospiza lincolnii striata* Brewster to *Melospiza lincolnii gracilis* (Kittlitz).

—*Harry C. Oberholser.*

THE SPECIFIC NAME OF THE HAWK OWLS.

Linnaeus described the European hawk owl under two names in the first edition of his Systema Naturae (1758, I, p. 93)—as *Strix funerea* and *Strix ulula*. The former is based primarily on Fauna Suecica, No. 51, the latter on Fauna Suecica, No. 52. As has been stated by various authors, there is no doubt of the equal pertinency of these names, and although by

recent writers the latter has been used, *Strix funerea* stands first on the page, and as it thus has anteriority, should be adopted in place of *Strix ulula*. The names of the two forms of the species will by this procedure stand as:

Surnia funerea funerea (Linnaeus),
Surnia funerea caparoch (Müller).

—*Harry C. Oberholser.*

PIRANGA ERYTHROMELAS VERSUS *PIRANGA MEXICANA*.

The name *Piranga erythromelas* which has long been used for the scarlet tanager is much antedated by *Loxia mexicana* Linnaeus (Syst. Nat. ed. 10, I, 1758, p. 172), applied undoubtedly to the same bird. Linnaeus (*loc. cit.*) gives the following diagnosis and locality:

"L[oxia] rubra, alis nigris.

Habitat in America *australi*."

He gives also a reference to Seba, whose description, though not long, is accurate and perfectly applicable.

This description (Locuplet. rer. natural. thesauri accur. descript. et icon. artific. express., I, 1734, p. 101, t. 65, f. 1) is in full as follows:

"*Avis, mexicana, grandis, rubra; passeris species.*

"Quae caput, thoracem, & dorsum ejus vestiunt, pennae sanguinei sunt coloris; dum pennae remiges & cauda, prorsus nigricant, rubedine tamen aliquâ supernam partem obtegente."

Linnaeus in a later connection (Syst. Nat. ed. 12, I, 1766, p. 300) somewhat amplifies his first account by describing the bird as "L. rubra, alis caudaque nigris," and adding as a synonym the *Coccothraustes mexicana* of Brisson (Ornith. III, 1760, p. 256). Brisson also cites Seba, and furthermore gives a detailed description of his own that in all particulars of color and dimensions agrees almost exactly with the bird now called *Piranga erythromelas*, and with this alone. It might be mentioned that Salvin and Godman long ago announced (Biol. Cent.-Am. Aves, I, 1886, p. 424) this identification of Linnaeus' *Loxia mexicana*, but for reasons of their own continued to use the name then current for the species—*Pyranga rubra*. There seems now, however, no reason for rejecting the exclusively pertinent name given by Linnaeus, even though on a subsequent page (Syst. Nat. ed. 10, I, 1758, p. 174) he uses the term *Loxia mexicana* for an entirely different species—undoubtedly *Spiza americana* (Gmelin)! Our present bird should therefore in future be called *Piranga mexicana* (Linnaeus).

—*Harry C. Oberholser.*

THE NAMES OF THE PASSENGER PIGEON AND THE MOURNING DOVE.

To those naturalists who, like the British, use the twelfth edition of Linnaeus (1766) as the starting point of binomial nomenclature, the names of the Passenger Pigeon and the Mourning Dove are clear and offer no complications. Not so, however, to the Americans and others who start

with the tenth edition (1758), for here Linnaeus unquestionably included both birds in the references under his *Columba macroura.*

The A. O. U. committee on nomenclature and American ornithologists generally have of late years used this name for the Mourning Dove, and have called the Passenger Pigeon by the name that first appeared in the twelfth edition—*Columba migratoria* Linn. In my opinion, however, this is hardly correct.

Linnaeus' *Columba macroura* was based on Edwards p. 15, t. 15, and Catesby p. 23, t. 23. Edwards' bird, carefully described and well figured, was of course a Mourning Dove, but it came from the West Indies, and Edwards tells us, "The Figure of this Bird shews it of its natural Bigness." Measuring the various parts and comparing the results with specimens, I find it altogether too small for the continental form of the Mourning Dove, and to agree very well with the small form of Cuba (and other islands of the Greater Antilles?) which has lately been named *Zenaidura macroura bella* by Palmer and Riley. The reference to Catesby applies wholly to the Passenger Pigeon and the plate shows a fine adult male.

Now as all Linnaeus' references were given chronologically it matters not which came first, and the important question is from which of these two distinct species, confused under one name, did Linnaeus take his brief diagnosis and his "Habitat." In this instance it is plain. Linnaeus' diagnosis reads "pectore purpurascente," and he also says "Habitat, in Canada: *hybernat in* Carolina," both directly from Catesby, and neither having anything whatever to do with Edwards.

In the twelfth edition Linnaeus dropped *Columba macroura*, called the Passenger Pigeon *Columba migratoria*, the Carolina Mourning Dove *Columba carolinensis*, and named the bird of Edwards' plate No. 15 *Columba marginata.*

It is therefore my opinion that we who stand by the tenth edition must arrange the names of these Columbæ as follows:

Ectopistes macrourus (Linn.)

Passenger Pigeon.

Columba macroura Linn., S. N. ed. 10, p. 164, 1758.

Zenaidura carolinensis carolinensis (Linn.)

Carolina Mourning Dove.

Columba carolinensis Linn., S. N. ed. 12, p. 286, 1766.

Zenaidura carolinensis marginata (Linn.) *

West Indian Mourning Dove.

Columba marginata Linn., S. N. ed. 12, p. 286, 1766.

—*Outram Bangs.*

* As to this latter name's supplanting *Zenaidura carolinensis bella* (Palmer and Riley) I can not help feeling regret that a good modern name founded on a bird from a definite region should give way to an old one without definite type locality. But I can see no help for it. Edwards distinctly says his bird was from the West Indies, and figures a very small example, and as the small size of the Cuban Mourning Dove is about its only distinctive character, I am afraid the *Columba marginata* Linn. must be the name by which it shall be known.

THE PROPER NAME FOR THE WHITE-BACKED SKUNK OF COLOMBIA.

The name *Conepatus mapurito*, based on *Viverra mapurito* Gmelin, 1788, has long been in use for the white-backed skunks of northern South America, and indeed until quite recently was used in a broad sense for all the members of the genus.

It now appears that this name is preoccupied by *Viverra mapurita* Müller, 1776.* The animal described very briefly by Müller† is a species of *Spilogale*, as is evident from the reference to the *Zorille* of Buffon.

In seeking for another name for the South American *Conepatus*, I find that *Viverra semistriata* Boddært, 1785,‡ is strictly available, and even if *V. mapurito* Gmel. were not preoccupied, Boddært's name, being of earlier date and having the same basis, would have to be used.

Both Boddært and Gmelin based their names on a description by Mutis of the skunk occurring at the mines of Pamplona, in the mountains of Colombia.§ I have seen no specimens from that region, and the description of the color pattern given by Mutis‖ differs slightly from that of two specimens from Merida, Venezuela, kindly furnished me by Dr. J. A. Allen. The apparent discrepancy may be due either to the ambiguity of the Latin description or to individual variation in the species. It is not probable that more than one species occurs in the vicinity of Pamplona, and this should now be known as *Conepatus semistriatus* (Boddært).—*Arthur H. Howell.*

THE PROPER NAME FOR THE EASTERN SKUNK.

Dr. D. G. Elliot, in his recently published Check List of Mammals,¶ proposes to replace the name *Mephitis putida* Boitard by *Mephitis olida* Boitard, on the ground that the former is preoccupied by "*Mephitis putida*" Cuvier, 1798. As a matter of fact, Cuvier did not use the combination "*Mephitis putida*," but proposed *Mustela putida* as a substitute for *Viverra putorius* Linn., and so far as I have been able to determine, his name was never adopted by later authors.

I have elsewhere shown** that *Mustela putida* Cuv. does not belong to the genus *Mephitis* as now understood, so that Boitard's *Mephitis putida* is not preoccupied by Cuvier's *Mustela putida* and should stand for the common Eastern skunk.—*Arthur H. Howell.*

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* Natursystems Supplements, p. 32. Sherborn ("Index Animalium," p. 584) quotes this name as "*napurita*," but in the copy in the library of the Department of Agriculture it is spelled with an "m."

† "*Er hat einen lockeren haarigen Schwanz, und ist am Körper weiss und schwartz gefleckt.*"

‡ Elenchus Animalium, p. 84.

§ Abhand. Schwedisch Akad. Wiss., 1770, p. 68.

‖ "*Color totius corporis nigerrimus est: Corpus supra longitudinaliter maculatum linea albissima, in fronte admotum latiori, ibidem utrinque connexa, deinde retrorsum tenuiori facta, usque ad medium dorsi decurrente. Cauda tota nigerrima est, apice vero albida.*"

¶ "Check List of Mammals of the No. Amer. Continent," etc., Field Columbian Mus. Zool. Ser. VI, p. 406, 1905.

** Proc. Biol. Soc. Wash., XV, pp. 2-5, 1902.

THE PROPER NAME FOR THE STRIPED MUISHOND OF SOUTH AFRICA.

In both Trouessart's Catalog* and Sclater's "Mammals of South Africa,"† the striped muishond bears the name *Zorilla striata*. As shown below, the generic name *Zorilla* is untenable, so the next name to be applied to this group must be adopted. This appears to be *Ictonyx* Kaup, 1835, based on "*Der Capische Zorille. Ictonyx capensis.*"‡

The specific name *striata* dates from Shaw, 1800,§ but is based on *Viverra putorius* Linn. and therefore refers to a species of *Spilogale*. The striped muishond is figured on the same plate as a variety of *Viverra striata* but *is not named*. The earliest specific name proposed for the Cape of Good Hope animal seems to be *Mephitis capensis* A. Smith, 1826,‖ which species should now be known as *Ictonyx capensis* (A. Smith).—*Arthur H. Howell.*

THE GENERIC NAME *ZORILLA*.

The name *Zorilla* was first used in a generic sense by Oken in 1816.¶ In the classified list of names at the beginning of the volume it appears as a subgenus of "*Muffer*" with a reference to page 1,000. The generic name is not used in the text, but from a careful examination of the arrangement of groups it seems clear that *Zorilla* was intended to apply to group "*c. Iltisst.*" [=*Iltisstinkthiere*], which begins on page 999 and contains three forms. The first of these is named "*Vir. Zorilla*" and should, on account of the tautonomy, be considered the type of the genus. The brief diagnosis** is however insufficient to identify even generically the animal in question. It is referred to the "*Mapurito oder Mafutiliqui*" of the Orinoco [South America] but so far as known, the skunks of that region all belong to the genus *Conepatus*, and are not spotted.

The name *Zorilla* is in use at the present time by most authors for the zorillas of South Africa, but it is clear from the above evidence that it can not be used for that group, but must be rejected on account of its inadequate basis.—*Arthur H. Howell.*

A BEAR ANIMALCULE RENAMED.

In 1851 Dujardin (Ann. des sci. nat. Ser. III, Vol. V. p. 164) employed the name *Lydella* to designate a very remarkable, microscopic, marine creature apparently related to the bear animalcules. A specific name was not supplied until 1888, when Plate (Zoölog. Jahrbücher. Morphol. Abth. Vol. III, p. 533) called it *Lydella dujardini* in honor of its discoverer. Unfortunately *Lydella* is preoccupied. In 1830 Desvoidy employed it for a

* Catologus Mammalium, Suppl., p. 191, 1904-1905.

† The Fauna of South Africa, by W. L. Sclater, Mammals, I, p. 113, 1900.

‡ Das Thierreich, I, pp. 352-353, 1835.

§ General Zoology, I, pt. 2, p. 387, 1800.

‖ Descriptive Catalog South African Museum, p. 20, 1826. I am indebted to Mr. R. C. Wroughton of the British Museum, for a transcript of Smith's description.

¶ Lehrbuch der Naturgeschichte, 3 ter Theil, Zool. 2te Abth., p. XI, 1816.

** "*Pelz sanft, ganz gefleckt von weiss und schwarz, Schwz verhältnissmässig, und schön behaart.*"

genus of flies, and again in 1835 Macquard used it in the same group. Thus doubly antedated, *Lydella*, as a genus of bear animalcules, must be abandoned. In its place I propose **Microlyda**.

It should be remarked in passing, that the name Tardigrada, so long and so generally employed for the group of which *Microlyda* is a member, is itself antedated. It was first used in the present connection, as a family name, by von Seibold as the Latin equivalent of Doyères' French appellation "les tardigrades," apparently not knowing that it had previously been used by Illiger (1811), Cuvier (1817), Burmeister (1830), and probably others for a group of mammals. In 1861 C. A. S. Schultze called attention to this and offered the family name Arctiscoida as a substitute. The case had been already provided for, however. Xenomorphida, established by Perty (Isis von Oken, p. 1241, 1834), as a family of crustaceans, included all the bear animalcules then known and nothing else. As both Arctiscoida and Xenomorphida were given as family names, other things being equal, they would have precisely the same claims for adoption as class or ordinal names. But since Arctiscoida is clearly antedated, Xenomorphida should be accepted as the name of the group.— *W. P. Hay.*

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF AN APPARENTLY NEW SPECIES OF MONKEY OF THE GENUS *PRESBYTIS* FROM SUMATRA, AND OF A BAT OF THE GENUS *DERMANURA* FROM MEXICO.

BY D. G. ELLIOT, F. R. S. E.

The specimens here described came into the possession of the Field Museum through different channels. The *Presbytis* was purchased from a dealer in Sumatra, and the *Dermanura* was collected by Messrs. Heller and Barber in Mexico.

Presbytis fusco-murina sp. nov.

Type locality.—Telok Betong, south Sumatra. Type No. 14,803.

General Characters.—A long occipital crest, inclining backward; face, hands and feet white or flesh-colored.

Color.—A narrow line across forehead running backward along side of head above ears and widening as it goes, to occiput, where it joins the long central occipital crest; entire upper parts of body, outer side of arms from wrist, and upper side of tail dark mouse gray tinged with brown; top and sides of head beneath the dark line, cheeks, throat, under side of body, inner side of arms, hind legs from hips on both inner and outer sides, face, ears, hands, feet, and tail beneath white.

Measurements.—Total length (dried skin), 1280; tail, 600. This can only be considered an approximate measurement. Skull: occipito-nasal length, 95; Hensel, 61; zygomatic width, 71; intertemporal constrictions, 45.5; breadth across orbits, 60; width of braincase, 56; width of orbit, 23; height of orbit, 24.5; height of nasal aperture, 13; breadth of nasal aperture, 9; length of nasals, 9; palatal length, 30; breadth of palate inside m^2, 19; length of upper molar series, alveolar border, 24; length of upper molars, 16; length of upper canines, 15; length of mandible, 59; length of lower molar series, 29; length of lower molars, 18; length of lower canine, 12.5.

This rather strangely colored Presbytis belongs apparently to the group which contains *P. thomasi* and *P. hosei*, but is at once distinguished from

those species by its white face, hands, and feet, and entirely white hind legs. The hairs on top of the head, while rather long, can hardly be considered as forming a crest, but lengthen gradually as they approach the very lengthened occipital crest. While the white of the top of the head is encircled by a dark line as in *P. thomasi* there is no central line in the white so conspicuous in that species, but like that animal, there is no chin tuft. The coloring of this form and its distribution is quite unlike that of the two species above mentioned. The sex of this specimen was not indicated, but from the relative measurements of the adult male and female *P. thomasi* from northern Sumatra, I should judge it to be a female.

Dermanura jucundum sp. nov.

Type locality.—Achotal, State of Vera Cruz, Mexico. Type No. 14,798.

General characters.—Similar to *D. quadrivittatum*, but with a much smaller skull, and the nose behind the nose-leaf whitish. Wing membranes from ankles.

Color.—Two very conspicuous stripes from posterior base of nose-leaf to top of head, and a very indistinct one on each side just in front of angle of mouth going backwards towards ears but not reaching them, pure white. Top of nose between the white stripes behind nose-leaf very pale brown, but with so many white hairs intermingled with the brown that in certain lights it appears nearly as white as the stripes. No stripes along spine. Entire upper parts dusky brown, beneath paler. Wings, membranes and feet, black; ears brownish black.

Measurements.—Total length, 65; foot, 11.5; ear, 16; forearm, 43; tibia, 16. Skull: Occipito-nasal length, 17; Hensel, 13; zygomatic width, 11; width of braincase, 9; height of braincase, 9; palatal length, 7; width between last molars, 4; length of upper molar series, 5; length of nasals, 4; width of rostrum, 6; length of mandible, 12; of lower molar series, 5.

But one specimen of this pretty little bat was procured by Messrs. Heller and Barber among the great number secured at Achotal. It is allied to *D. quadrivittatum* from South America, but is smaller, with a considerably smaller skull. From *D. cinereum*, it differs in color and in the possession of white streaks on head and face, these being absent in Gervais's species.

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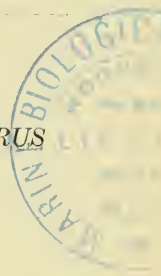

THE PIGMY SQUIRRELS OF THE *NANNOSCIURUS MELANOTIS* GROUP.

BY MARCUS W. LYON, JR.

By permission of the Secretary of the Smithsonian Institution.

The material on which this paper is based comprises twenty-nine skins with skulls in the collection of the United States National Museum, three from Java, eleven from western Borneo, one from Sumatra, three from Sinkep and eleven from Banka. All except those from Java were collected by Dr. W. L. Abbott, and made up as dry skins in the field. The Javan specimens were obtained from Wilhelm Schlüter, Halle a. S. They were sent to him from Java in a preserving fluid, but were taken out and dried immediately on reaching his establishment. I have also had at my disposal manuscript notes on the original specimens of *Nannosciurus melanotis* in the Leyden Museum made by Mr. Gerrit S. Miller, Jr.

Two species have hitherto been recognized, *melanotis* * recorded from Java, Sumatra and Borneo, and *pulcher* known only from Sinkep. The Sumatran and Bornean animals are here described as distinct as well as the one from Banka.

Key to the species of Pigmy Squirrels of the *Nannosciurus melanotis* group.

a. Nape slightly grayer than crown, no distinct patch. *melanotis*.
a[1]. Nape with distinct whitish patch.
b. Yellowish brown, upperparts finely and *evenly* grizzled with black.
c. Upperparts most like Ridgway's Isabella color with black grizzling. *borneanus*.
c[1]. Upperparts most like Ridgway's tawny olive with black grizzling. *bancanus*.

* Here restricted to the Javan form. There were two specimens from Java in the original series and one each from Borneo and Sumatra. Mr. Miller thinks the description was based mainly on the Javan specimens.

b^1 Yellowish brown upperparts *irregularly* grizzled with black.

d. Size larger, gnathion to occipito-sphenoid suture more than 16 mm. *pulcher*.

d^1. Size smaller, gnathion to occipito-sphenoid suture about 15 mm. *sumatranus*.

Nannosciurus melanotis (Müller and Schlegel).

1839–44. *Sciurus melanotis* Müller and Schlegel, Verhandel. over de Natuurlijke Geschiedenes der Nederl. overzeesche Bezittingen, p. 98, Pl. XIV, fig 5.

Cotypes.—In the Leyden Museum, four specimens, one from Padang, western Sumatra (♀ *a*. No. 1. 1837), one from Borneo (♂ No. 3 *c*), and two from Java (♀ *h*. No. 8 and *g*., no sex, No. 7). The name *melanotis* is here restricted to the Javan animal, since most of the original series came from Java, and the greater part of the description is based on them.

Characters.—Distinct nape patch wanting, nape merely grayer than crown. General color darkest of the group.

Color.—Based on Nos. 121,494–121,496 U. S. N. M. Upper surface of head and body, outer surfaces of legs and sides a color intermediate between Ridgway's hazel and chestnut finely and evenly grizzled with black. A small area on the nape is lighter and similar to wood-brown. Hairs of the underparts blackish-slate at base, tipped with a dark vinaceous buff. Upper surface of feet similar in color to back. Postauricular spot black, conspicuous, extending from 5–7 mm. behind the ear. Outer side of ear black, inner side similar to back. Light head stripe vinaceous buff to whitish about 1.5 mm. wide in front and about twice as wide under the ear. Ring over the eye same color as head stripe, about 1 mm. wide. Preorbital stripe black, about 1 mm. wide. Hairs of tail (except at tip) ringed as follows: Hazel, blackish, rich hazel, black, light vinaceous buff, and inconspicuous black tip. At tip of tail the hairs are longer and after the second hazel ring are blackish brown.

Skull and teeth.—These show no characters by which to distinguish *Nannosciurus melanotis* from other related species except *N. pulcher* which has a slightly larger skull.

Measurements.—The hind feet with claws in the three specimens measure 22.2, 22.5, 22.7 mm.; gnathion to occipito-sphenoid suture, 15.5 mm.; greatest breadth of skull, 15.9–16.5; interorbital constriction, 9.5–10 mm.

Specimens examined.—Three from near Batavia, Java—one male, one female and one of unknown sex.

Remarks.—The above three skins differ in their red brown color from all the other specimens of this group, from the figure published with the original description and, judging from Mr. Miller's notes on the original series in Leyden, from the cotypes. It is to be noted that the cotypes are mounted and have been exhibited for over half a century, and that the three specimens in the National Museum have been in a preserving fluid. It is possible that when more specimens are secured from Java two forms will be found to occur on that island. The above three specimens, the cotypes, and the original figure all agree in the absence of a well defined nape patch

Nannosciurus pulcher Miller.

1902. *Nannosciurus pulcher* Miller, Proc. Acad. Nat. Sci., Philadelphia, March, 1902, p. 154. Issued June 11, 1902.

Type.—Adult female, skin and skull, No. 113,131, United States National Museum, from Sinkep Island, south China Sea.

Characters.—A large member of the *melanotis* group with well defined nape patch, the yellow-brown body not distinctly grizzled. Gnathion to occipito-sphenoid suture more than 16 mm.

Color.—Upperparts and sides of body and outer side of legs like a light Isabella color of Ridgway tinged with olive, or like a pale raw umber, with an uneven speckling of black. Top of head darker inclining to a dull dark tawny ochraceous. Hairs of underparts with blackish slate bases and ochraceous buff tips. Hind feet indistinct, dull tawny; fore feet like back. The light colored head stripe is distinctly tinged with yellow in the type, in No. 123,098 with pinkish buff, and in No. 123,099 is nearly clear white. The stripe is about 2 mm. wide in front and 3–5 mm. under the ear. In the type there is scarcely any indication of a supraorbital halfring; in the other two specimens there is a dull pinkish-buff line about 1 mm. wide. Nape patch whitish tinged with yellowish in the type, with vinaceous buff in No. 123,098. External surface of ears black, internal similar to back. Postauricular spot black, not so large as in *melanotis*, extending 2–3 mm. behind ear. Preorbital stripe blackish, 1–2 mm. wide. Hairs of tail ringed as follows: dull ochraceous, blackish, tawny-ochraceous, black, white, black. At the tip of the tail after the second tawny ring the rest of the hair is black.

Skull.—The skull is a little larger than that of the other members of this group, gnathion to occipito-sphenoid suture about 16.5 mm. instead of 15–15.5 in the other species.

Measurements.—Head and body, 85–95; tail vertebrae, 70–77; hind foot with claws, 23.3–23.7. Skull: Gnathion to occipito-sphenoid suture, 16.4–16.7; greatest breadth, 16.7–17.2; interorbital constriction, 10–11.5.

Specimens examined.—Three—two males and one female; all from Sinkep Island.

Remarks.—*Nannosciurus pulcher* is most like the Sumatra animal, from which it differs by its slightly larger skull and slightly brighter color. It is conspicuously different from *N. melanotis* in its yellow brown instead of red brown color and in its distinct nape patch.

Nannosciurus sumatranus sp. nov.

Type.—Adult male, skin and skull, No. 141,058, United States National Museum. Collected at Tarussan Bay, western Sumatra, January 16, 1905, by Dr. W. L. Abbott. Original number 3946.

Characters.—Very similar to *Nannosciurus pulcher* Miller, from which it differs in its smaller size and less bright coloration of the upperparts; gnathion to occipito-sphenoid suture 15–15.5 mm. instead of 16–16.5 mm.

Color.—Type: General color of upperparts most like Ridgway's Isabella

color, irregularly lined with blackish. Top of head dull ochraceous, lined with black. Feet dull ochraceous. Hairs of underparts slaty at base, dull ochraceous buff at ends. Light head stripe whitish tinged with buffy, 2 mm. wide in front and 5 mm. wide under ear. Preorbital stripe black 1.5–2 mm. wide. Supraorbital halfring not distinct, about 1 mm. or less wide, dull ochraceous buff. External surface of ears black, internal surface similar to top of head. Postauricular spot black, not large, extending 1–2 mm. behind ear. Nape patch well defined, light cream to pinkish buff. Hairs of tail ringed as follows: Dull ochraceous, blackish, dull ochraceous, black, white, black. At tip of tail, after the second ochraceous ring, the hairs are uniformly black.

Skull.—The skull of *N. sumatranus* shows no appreciable differences from that of related species except *N. pulcher* which is slightly larger.

Measurements.—Type: Head and body, 83; tail vertebrae, 72; hind foot with claws, 23.8. Skull: Gnathion to occipito-sphenoid suture, 15; greatest width, 15.8; interorbital constriction, 9.6; maxillary toothrow (alveoli), 4.

Specimens examined.—One, the type.

Remarks.—This is the Sumatran representative of the group. The single specimen agrees closely with Mr. Miller's notes on the Padang specimen in the Leyden Museum. It differs from the Javan specimens in having a conspicuous nape patch, wide head stripe under the ear, and small postauricular spot, as well as in its general yellow brown instead of red brown coloration.

Nannosciurus borneanus sp. nov.

Type.—Adult female, skin and skull, No. 142,271, United States National Museum. Collected in Sanggan, western Borneo, August 23, 1905, by Dr. W. L. Abbott. Original number 4368.

Characters.—A yellow brown member of the group, with distinctly grizzled back, and well marked, light colored nape patch, which, however, is not so light nor distinct as it is in *Nannosciurus pulcher* or *sumatranus*.

Color.—Type: Upperparts and sides of body and outer sides of legs a fine distinct, even grizzle of a light Isabella color tinged with olive, and black. Top of head a grizzle of dull ochraceous and black. Hind feet a dull hazel; forefeet similar to back. Base of hairs of underparts slate color; ends dull ochraceous buff. Head stripe, whitish, slightly tinged with buffy, nearly 2 mm. wide in front and 5–7 mm. wide under the ear. Preorbital stripe narrow, about 1 mm. wide, blackish, specked with ochraceous. Supraorbital halfring not well marked, 1 mm. or less, dull ochraceous. Internal surface of ears similar to top of head. External surface of ears black. Postauricular spot black, extending 4–5 mm. behind ear. Nape patch well defined, dirty white, grayish posteriorly. Hairs of tail ringed thus: dull ochraceous, blackish ochraceous, black, white, black. At tip of tail, after the second ochraceous ring, the hairs are black to their ends.

Skull.—There are no constant characters by which the skull of *Nannosciurus borneanus* can be told with certainty from that of other members of the group, except *pulcher* which has a slightly larger skull.

Measurements.—Type: Head and body, 86 (75–90);* tail vertebrae, 65 (64–70); hind foot with claws, 22.6 (22–23.9). Skull of type: Greatest length, 25.3; basal length, 20; basilar length, 19.2; palatal length, 12.1; greatest breadth, 16.8 (14.9–16.8); gnathion to occipito-sphenoid suture, 15.6 (14.7–15.6); interorbital constriction, 10.6; greatest breadth of braincase, 14; nasals (median edge), 11; maxillary toothrow (alveoli), 3.8; mandible (condyle to front of symphysis), 14; mandibular toothrow (alveoli), 3.6

Specimens examined.—Ten males and one female, all from western Borneo, near the coast.

Remarks.—The type specimen represents the series very well; a few of the specimens are more ochraceous in the underparts and some have irregular tinges of buffy or vinaceous buffy in the nape patch or on the posterior part of the light head stripe, but never so much as in the Pigmy Squirrel from Banka. *Nannosciurus borneanus* is easily distinguishable from *N. pulcher* and *sumatranus* by its conspicuous fine grizzle, and from *melanotis* and *bancanus* by its lighter color and clear and distinct nape patch.

Nannosciurus bancanus sp. nov.

Type.—Skin and skull of adult female, No. 124,880, United States National Museum. Collected at Klabat Bay, Island of Banka, east of Sumatra, June 24, 1904, by Dr. W. L. Abbott. Original number 3430.

Characters.—Most like *Nannosciurus borneanus*, from which it differs in its generally darker color, more obscured nape patch and buffy face stripes.

Color.—Type: Upperparts and sides of body, and outer surfaces of legs, a fine grizzle of a color between Ridgway's tawny-olive and raw umber, and black, the former color in excess. Top of head dull tawny ochraceous grizzled with black. Underparts, including inner side of legs, with the hairs slaty at base, and ochraceous buff for the rest of their length. Forefeet similar to back; hairs of hind feet dull tawny. Light face stripe, about 1 mm. wide at nostril, 5 mm. wide beneath ear, generally buffy in color; for the first 2 or 3 mm. just behind nostril it is ochraceous buff and under the ear it inclines toward vinaceous buff. Preorbital stripe narrow, black, and slightly sprinkled with tawny. Supraorbicular halfring inconspicuous, dull ochraceous buff, scarcely 1 mm. wide. External surface of ears black; postauricular spot black; extending about 4 mm. behind ear. Internal surface of ear similar to top of head. Nape patch distinctly present, but not clear, a dark, dull pinkish buff of Ridgway, irregularly lined with blackish. Hairs of tail ringed as follows: dull ochraceous, blackish, ochraceous, black, white, black. At tip of tail the hairs are uniformly blackish after the second ochraceous ring.

Skull.—The skull of *Nannosciurus bancanus* shows no characters by which it can be distinguished from that of other species, except from *N. pulcher* which has a larger skull.

* Figures in parentheses are those of the extremes of the series.

Measurements.—Type: Head and body, 82 (78-90); tail vertebrae, 63 (63–70); hind foot with claws, 22 (22–23.6). Skull of type: Greatest length, 24.6; basal length, 18.8; basilar length, 17.6; palatal length, 10.8; greatest width, 15.8 (15.7–16 4); interorbital constriction, 10.1; greatest breadth of braincase, 13.7; gnathion to occipito-sphenoid suture, 15 (14.8–15.6); maxillary toothrow (alveoli), 3.7; mandible, condyle to front of symphysis, 13.5; mandibular toothrow (alveoli), 4.

Specimens examined.—Eight males and two females, from Klabat Bay, Banka; one male from Point Tedong, Banka.

Remarks.—None of the series show any important deviation from the type specimen. Two or three individuals have the nape patch slightly lighter in color than in the type, in this respect being quite similar to those of the Bornean series with the dull nape patches; but the general color of the body is always darker. The affinity of *Nannosciurus bancanus* to *N. borneanus* instead of to *N. sumatranus* is curious, as Banka is separated from Borneo by a wide deep channel, Karimata Strait, and from Sumatra by a narrow and comparatively shallow channel. One would expect the relationship to be the reverse.

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PROCEEDINGS

OF THE

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A NEW WHITE-FOOTED MOUSE FROM TEXAS.

BY VERNON BAILEY.

In a recent paper,* I gave the name *laceyi* to a mouse of the genus *Peromyscus* occurring in central Texas. Through a most unfortunate misconception the name was applied to the wrong one of the two species found together at the type locality, to the larger, darker colored form previously named *attwateri* by Dr. J. A. Allen. The smaller, paler animal is now for the first time described under the name *laceianus* as a subspecies of *pectoralis*, its nearest relative.

Peromyscus pectoralis laceianus subsp. nov.

Peromyscus attwateri Bailey, N. Am. Fauna No. 25, p. 99, 1905—not of Allen.

Type.—From ranch of Howard Lacey, on Turtle Creek, near Kerrville, Texas. No. 97,063, male adult, U. S. National Museum, Biological Survey collection. Collected May 3, 1899, by Vernon Bailey. Original number 6860.

General characters.—Tail as long as or a little longer than head and body; ears large; soles naked except at heels. Similar to *pectoralis* but with relatively shorter tail and duller colors and without pectoral spot. Considerably larger and darker than *eremicoides*.

Color.—Upperparts dark buffy gray, brightening to rich buff on cheeks and shoulders; lower parts, feet, and ankles white; tail sharply bicolor, gray above, white below.

Skull.—Relatively shorter and wider than in *pectoralis*, larger and heavier than in *eremicoides;* posterior tip of nasals truncate and flush with tips of premaxillae.

Measurements.—Type: Total length, 185; tail vertebrae, 95; hind foot, 23. Skull of type: Basal length, 22; nasals, 10; zygomatic breadth, 13.5; mastoid breadth, 11.2; alveolar length of upper molar series, 4.

Remarks.—From *Peromyscus boylei attwateri*, the other long-tailed species occurring with it, *laceianus* differs in smaller size and paler color, white instead of dusky ankles, more sharply bicolor tail, smaller bullae, and truncate instead of rounded posterior tip of nasals.

* North American Fauna No. 25, Biological Survey of Texas, p. 99, Oct., 1905.

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A NEW GENUS OF SAC-WINGED BATS.

BY GERRIT S. MILLER, JR.

While examining the bats in the Royal Museum of Natural History at Berlin, kindly placed at my disposal by Prof. Karl Möbius and Prof. Paul Matschie, I found four specimens from Surinam collected by Kappler and labeled by Peters as *Cormura brevirostris*. On comparing them with the original description and figure of this genus,* however, striking discrepancies were at once apparent. Another specimen of the same animal, from Baranciva, Brazil, was sent me by Dr. Lorenz von Liburnau of Vienna, with the information that the type of *Cormura*, originally in the Natural History Museum, can not now be found. The genus *Cormura* therefore rests wholly on the plate and description; and as these do not agree with the specimens it is necessary to name the animal represented in the museum of Vienna and Berlin.

Myropteryx gen. nov. (*Emballonuridæ*).

Type.—*Myropteryx pullus* sp. nov.

Characters.—Externally most nearly resembling *Peropteryx*, with which it agrees in position of wing sacs, but with broader head and more widely separated ears. Skull essentially like that of *Saccopteryx* but with shorter, relatively deeper rostrum. Teeth differing from those of all the previously known sac-winged genera in the absence of hypocone in first and second upper molar, and in the minute, early deciduous upper incisor.

Remarks.—This genus is well characterized by the complete absence of hypocones in the upper molars, and by the great reduction of the upper incisors. In the four adults examined the upper incisors are absent. In an immature individual, however, there are two very minute teeth in each premaxillary. Whether this condition is normal can only be conjectured, but neither tooth has the appearance of a remnant of the milk dentition, no trace of which can be found elsewhere. In the description of *Cormura* the upper incisors are merely said to be extremely small, while the figure

* Peters, Monatsber. k. preuss. Akad. Wissensch., Berlin, 1867, p. 475, pl. p. 480.

shows them of normal size for members of the group. No mention is made of the hypocones of the upper molars, but these cusps are unmistakably indicated in the plate.

Myropteryx pullus sp. nov.

Type.—Adult female (in alcohol). Royal Museum of Natural History, Berlin. Collected in Surinam, by Kappler.

Characters.—General appearance much as in *Peropteryx canina*, but larger, and with broader head, less pointed muzzle, and slightly smaller, much more widely separated ears (distance between ears about one-fifth height of ear from crown in *Peropteryx*, about one-half in *Myropteryx*). Ear of essentially the same form as that of *Peropteryx canina*, but antitragus less distinctly marked off, and tragus broader and a little bent forward owing to slight concavity of anterior border. Color when dried mummy-brown above, cinnamon, tinged with drab below, the hairs everywhere becoming lighter at extreme base, and those of back faintly darker at tip.

Measurements.—Type: Total length, 67; (61)*; tail, 12 (13); tibia, 16 (16); foot, 6.8 (7); forearm, 43.6 (45); thumb, 9 (9); second finger, 37.6 (37); third finger, 76 (75); fourth finger, 52 (51); fifth finger, 51 (49); ear from meatus, 14.4 (14); ear from crown, 11.4 (11); width of ear, 10.4 (10.4).

* Measurements in parenthesis are those of an adult male from the type locality

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SEVEN NEW MALAYAN BATS.

BY GERRIT S. MILLER, JR.

By permission of the Secretary of the Smithsonian Institution.

Among the Malayan bats in the United States National Museum are the following seven species that have not hitherto been described. All but two of them were collected and presented by Dr. W. L. Abbott.

Cynopterus princeps sp. nov.

Type.—Adult female (skin and skull). No. 141,235, United States National Museum. Collected at Mojeia River, Nias Island, west Sumatra, March 10, 1905, by Dr. W. L. Abbott. Original number, 4020.

Characters.—Slightly larger than the Javan *Cynopterus titthæcheilus;* color not as bright; skull with shorter rostrum; cheekteeth heavier, with more squarish crowns, the last premolar and first molar of lower jaw with small but distinct median cusp.

Color.—Type: Upperparts a peculiar brown intermediate between the wood-brown and hair-brown of Ridgway but darker than either, the crown slightly darker than back; individual hairs pale isabella-color at base. Sides of neck raw-sienna, this color extending across throat but becoming duller beneath, where the fur is sparser. Underparts elsewhere broccoli-brown with a faint yellowish tinge along sides. Ears and membranes blackish, unmarked.

Skull and teeth.—The skull rather closely resembles that of *Cynopterus titthæcheilus,* but the rostrum is distinctly shorter and the mandibular ramus is deeper. Cheekteeth heavier and more squarish than those of the Javan animal, the crown of the first and second lower molar with a low but distinct terete cusp about .3 mm. in diameter rising from crushing surface near middle.

Measurements.—Type: Head and body, 143; tail, 10; tibia, 30; foot, 20.5; forearm, 84.4; thumb, 35.9; second finger, 61.4; third finger, 143; fourth finger, 112; fifth finger, 110; skull, greatest length, 38.2; condylobasal length, 36.4; basilar length, 32.6; palatal length, 20.2; zygomatic breadth, 25.4; breadth of braincase, 15.6; interorbital constriction, 6.7; postorbital constriction, 5.8; mandible, 28.8; depth of mandible at front of anterior molar, 3.6; maxillary toothrow exclusive of incisors (alveoli), 12.2; mandibular toothrow exclusive of incisors (alveoli), 13.8.

Specimens examined.—Three, all from the type locality.

Remarks.—This very distinct species needs comparison with the Javan *Cynopterus titthæcheilus* only, an animal from which it differs in the shorter, broader rostrum and in the well-developed cusps on the crowns of $pm_{\overline{4}}$ and $m_{\overline{1}}$. Among 25 skulls of the Javan animal 17 show traces of a cusp on the crown of $m_{\overline{1}}$, while in only 3 is there any indication of such a structure in $pm_{\overline{4}}$.

Cynopterus major sp. nov.

Type.—Adult male (skin and skull). No. 141,236, United States National Museum. Collected at Mojeia River, Nias Island, west Sumatra, March 10, 1905, by Dr. W. L. Abbott. Original number, 4021.

Characters.—A large species considerably exceeding *Cynopterus sphinx* in size though not equal to *C. titthæcheilus*. Teeth broad, as in *Cynopterus titthæcheilus*, but not as large, and $pm_{\overline{4}}$ and $m_{\overline{1}}$ without trace of secondary cusp.

Color.—The color so closely resembles that of *Cynopterus princeps* that no detailed description is required. Brown of upperparts slightly more yellowish than in the larger animal and neck slightly darker. Ears and membranes similarly unmarked.

Skull and teeth.—Except for its smaller size the skull resembles that of *Cynopterus titthæcheilus*, having the same heavy rostrum and broad palate as compared with *C. sphinx*. Teeth differing from those of *C. sphinx* in the greater strength and breadth of the large premolars and molars.

Measurements.—Type: Head and body, 122; tail, 8; tibia, 29.3; foot, 16.8; forearm, 76.4; thumb, 31.3; second finger, 50.4; third finger, 123; fourth finger, 94; fifth finger, 95; skull, greatest length, 33.8 (37.3)*; condylobasal length, 32.2 (35.2); basilar length, 29 (31.8); palatal length, 17 (19.4); zygomatic breadth, 22.3 (24); breadth of braincase, 14.5 (14.8); interorbital constriction, 7 (7.6); postorbital constriction, 6.2 (6); mandible, 25.9 (28); depth of mandible at front of anterior molar, 3.2 (3.4); maxillary toothrow exclusive of incisors (alveoli), 11.1 (11.4); mandibular toothrow exclusive of incisors (alveoli), 12.8 (13.3).

Specimens examined.—Thirty-one (6 skins), all from Nias.

Cynopterus pagensis sp. nov.

Type.—Adult female (skin and skull). No. 121,581, United States National Museum. Collected on North Pagi Island, west Sumatra, November 12, 1902, by Dr. W. L. Abbott. Original number, 2028.

Characters.—Exactly similar to *Cynopterus major* except that the size is much less.

Measurements.—Type: Head and body, 106; tail, 4; tibia, 24.6; foot, 14.7; forearm, 69.8; thumb, 27; second finger, 46.2; third finger, 109; fourth finger, 89.7; fifth finger, 87.7; skull, greatest length, 30.8 (33.4)†;

*Measurements in parenthesis are those of an adult male *Cynopterus titthæcheilus* from West Java (No. 141,623).

†Measurements in parenthesis are those of an adult female *Cynopterus major* (No. 141,234.)

condylobasal length, 29.9 (32.2); basilar length, 26.9 (29.3); palatal length, 15.9 (16.8); zygomatic breadth, 19.4 (20.8); breadth of braincase, 12.9 (13.7); interorbital constriction, 6.5 (6.9); postorbital constriction, 6.5 (6.6); mandible, 23 (25); maxillary toothrow exclusive of incisors (alveoli), 9.9 (10.8); mandibular toothrow exclusive of incisors (alveoli), 11 (12.1).

Specimens examined.—Thirteen (2 skins), all from North Pagi Island.

Cynopterus minutus sp. nov.

Type.—Adult male (skin and skull). No. 141,240, United States National Museum. Collected on Nias Island, west Sumatra, March 11, 1905, by Dr. W. L. Abbott. Original number, 4043.

Characters.—Similar to the Javan *Cynopterus melanocephalus* (Temminck) but not as small and with no contrasts of color between the back, head, and underparts.

Color.—Type: The color differs very slightly from that of *Cynopterus major* and *C. pagensis*, except that the yellowish of the neck more extensively suffuses the sides, shoulders, and front half of back. Head very nearly fawn-color. Belly and chest broccoli-brown.

Skull and Teeth.—The skull and teeth show no peculiarities other than their small size. In form they are throughout similar to *Cynopterus sphinx*.

Measurements.—Type: Head and body, 83; tail, 2; tibia, 18.8; foot, 13; forearm, 52.4; thumb, 20; second finger, 36.7; third finger, 85; fourth finger, 66; fifth finger, 61; skull; greatest length, 26.2; condylobasal length, 25; basilar length, 22.5; palatal length, 12.9; zygomatic breadth, 16.4; breadth of braincase, 11.5; interorbital constriction, 5.3; postorbital constriction, 6; mandible, 19.5; maxillary toothrow exclusive of incisors (alveoli), 7.8; mandibular toothrow exclusive of incisors (alveoli), 8.9.

Specimens examined.—Twelve (one skin), all from Nias Island.

Pteropus baveanus sp. nov.

Type.—Adult male (skin and skull). No. 125,482, United States National Museum. Collected on Bawean Island, Java Sea, July 19, 1904, by W. Grasshoff. Original number, 16.

Characters.—A large, dark colored member of the *Pteropus hypomelanus* group; forearm about 160 mm.

Color.—Type: Back and underparts blackish, the former distinctly grizzled with gray and lightening to bister posteriorly, the latter slightly varied with highly glossed, pale russet annulations, particularly on chest and belly. Mantle russet, strongly suffused with blackish. Head blackish. Ears and membranes black.

Skull and teeth.—The skull and teeth resemble those of *Pteropus lepidus* in form, but are throughout somewhat larger.

Measurements.—Type: Head and body, 272; tibia, 73.4; foot, 47.4; forearm, 160; thumb, 59; second finger, 107; third finger, 285; fourth finger, 225; fifth finger, 202; skull, upper length, 63.4; condylobasal length, 64.6; median palate length, 32.8; zygomatic breadth, 35; interorbital constriction, 8.8; postorbital constriction, 7.2; breadth of braincase, 23; man-

dible, 52.6; maxillary toothrow exclusive of incisors (alveoli), 25; mandibular toothrow exclusive of incisors (alveoli), 28.6.

Specimens examined.—Fourteen, all from Bawean.

Remarks.—The specimens show no special variations either in color or in size. The shortest forearm that is certainly uninjured measures 151 mm. This is decidedly the largest member of the *Pteropus hypomelanus* group yet discovered. Its size and dark color readily distinguish it from its allies.

Pteropus niadicus sp. nov.

1889. *Pteropus nicobaricus* Modigliani, Ann. Mus. Civ. di Stor. Nat. di Genova (2) VII, p. 239.

Type.—Adult male (skin and skull). No. 141,233, United States National Museum. Collected at Teliwaa, Nias Island, west Sumatra, March 5, 1905, by Dr. W. L. Abbott. Original number, 3981.

Characters.—Similar to *Pteropus nicobaricus* (Zelebor), but with back gray instead of black, and head not darker than mantle.

Color.—Type: Back a grizzled gray rather closely resembling the hair-brown of Ridgway, with a slight yellowish cast along sides and a darker wash in median region. Mantle light russet heavily clouded with blackish, the latter predominating. On head the black is less noticeable and the russet becomes paler, so that the mantle is noticeably darker than the head. Underparts blackish anteriorly, russet along middle of chest and belly, light hair-brown on flanks and under side of thighs. Ears and membrane black.

Skull and teeth.—The skull and teeth do not differ appreciably from those of *Pteropus nicobaricus*.

Measurements.—Type: Head and body, 270; tibia, 68.4; foot, 52.4; forearm, 152.4; thumb, 66.2; second finger, 114; third finger, 287; fourth finger, 234; fifth finger, 205; skull, upper length, 69; condylobasal length, 69.4; median palatal length, 34.8; zygomatic breadth, 38.2; interorbital constriction, 9.8; postorbital constriction, 8; breadth of braincase, 23.6; mandible, 56.4; maxillary toothrow exclusive of incisors (alveoli), 26.8; mandibular toothrow exclusive of incisors (alveoli), 30.4.

Specimens examined.—Three, all from Nias Island.

Remarks.—Though nearly related to *Pteropus nicobaricus* this species is easily distinguishable by its gray back and light colored head. In ten skins of *Pteropus nicobaricus* the head is without exception conspicuously darker than the mantle, while the back is almost black.

Kerivoula depressa sp. nov.

1892. *Kerivoula hardwickii* Thomas, Ann. Mus. Civ. di Stor. Nat. di Genova, (2) X, p. 927.

Type.—Adult female (in alcohol). No. $\frac{18533}{3819}$, United States National Museum. Collected at Biapo, Carin Hills, northeast of Tounghoo, southern Burma, by L. Fea.

Characters.—Similar to *Kerivoula hardwickii* but with smaller ears, shorter

tibia and smaller foot; skull with braincase nearly 1½ times as broad as deep.

Color.—After its long immersion in alcohol the fur is lighter and yellower than that of four Javan skins of *Kerivoula hardwickii*. Upperparts between buff and cream-buff, the tips of the hairs darker, producing a distinct clouding of broccoli-brown. Underparts similar but without the clouding. Hairs everywhere prouts-brown through basal half. Ears and membranes uniform brown.

Skull and teeth.—The skull is readily distinguishable from that of *K. hardwickii* by its low, flattened braincase (see measurements) and narrower palatal and narial emarginations. Teeth not obviously different from those of the Javan animal.

Measurements.—Type: Head and body, 32.6; tail, 428; tibia, 15.4; foot, 6; forearm, 32.8; thumb, 7; second finger, 34; third finger, 70; fourth finger, 48; fifth finger, 48; ear from meatus, 11.6; ear from crown, 10; skull, greatest length, 13.5 (14.2)*; condylobasal length, 12.6 (13.4); median palate length, 6.2 (6.5); zygomatic breadth, 8.2 (8.7); interorbital constriction, 3 (3); breadth of braincase, 7 (7.2); depth of braincase including audital bullæ, 5.5 (6.5); mandible, 9.5 (10); maxillary toothrow exclusive of incisors (alveoli), 5.2 (5 8); mandibular toothrow exclusive of incisors (alveoli), 5.7 (6.2).

Specimens examined.—Two, the type from Burma, and a second specimen (female, No. $\frac{17909}{36568}$) from Cambodia.

* Measurements in parenthesis are those of an adult female *Kerivoula hardwickii* from western Java (No. 141,590).

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THE STATUS OF THE GENERIC NAME *HEMIPROCNE* NITZSCH.

BY HARRY C. OBERHOLSER.

The generic name *Hemiprocne* Nitzsch is commonly considered to date from this author's "Pterylographie," 1840, pp. 31, 123, but it was first proposed eleven years before in an anatomical paper usually overlooked (Observ. Av. Arter. Carot. Com., 1829, p. 15), in the main text and its accompanying footnote, after the following fashion:

"3. *Macrochires* (S. longimanae) in duas dividendae tribus, quarum una continentur Trochili, altera Cypseli et Hemiprocnes N. [h]) genera. Hae aves itidem dextra arteria carot. communi semper carere videntur."

"[h]) Hemiprocnes genus, cui Cypselos, qui ill. Temminckio longipennis, comatus, fuciphagus, torquatus vocantur, aliosque accensio, a veris discrepant Cypselis et hallice sive digito pedum primo retrorsum semper verso, et digitorum phalangum numero eodem, qui in ceteris avibus solemnis est."

Although in this place, as will be noticed, the word occurs in the nominative plural to conform to the Latin construction of the sentence, the author's intent is clear, particularly in light of his use of the name in the singular form *Hemiprocne* a few years afterward in his "Pterylographia Avium, pars prior," 1833, page 21,—though here without diagnosis or mention of any species,—and still later (Pterylographie, 1840, pp. 31, 123) when he gives a formal diagnosis and includes the species *Hirundo zonaris* Shaw and *Hirundo acuta* Wied (=*Chaetura cinereiventris* Sclater).

Meanwhile, however, a little-known author in a forgotten book (Riemann, Zoolog.-technol. Leitfaden für Realschulen und

Gymnasien, 1838, p. 34) made use of the name as follows, for which quotation I am indebted to Dr. Charles W. Richmond:

"*Hemiprocne*.—Salange. Die vorigen Gattung ähnlich, aber mit gewöhnlicher Gliederung und Richtung der Zehen. *H. esculenta*, die indianische Schwalbe."

By taking the term *Hemiprocne* from Nitzsch, 1840, the type has been fixed as *Hirundo zonaris* Shaw; but this disposition of the name can not stand, as may readily be seen by the above references. If the earlier (1829) Nitzsch diagnosis be ignored, the name will date from Riemann, 1838, and must displace *Collocalia*; but there is no sufficient reason for rejecting *Hemiprocne* as proposed by Nitzsch in 1829 (*loc. cit.*) since it was then properly introduced into nomenclature. The species originally included are now called *Macropteryx longipennis*, *Macropteryx comatus*, *Collocalia fuciphaga*, and probably *Hemiprocne zonaris*, respectively. The last appears as "*torquatus*," a name apparently to be referred to the present *Hemiprocne zonaris*, but here a nomen nudum and therefore not to be used in this connection. Of the three others, the first one mentioned, *Hirundo longipennis* of Rafinesque (*Cypselus longipennis* Temminck), should be considered the type. The name *Hemiprocne* must therefore unfortunately supplant the later *Macropteryx* Swainson* and the family name Macropterygidae be changed to Hemiprocnidae. The following species of this group are affected, and should henceforth stand as follows:

Hemiprocne coronata (Tickell).
Hemiprocne longipennis (Rafinesque).
Hemiprocne perlonga (Richmond).
Hemiprocne wallacei (Gould).
Hemiprocne mystacea mystacea (Lesson).
Hemiprocne mystacea woodfordiana (Hartert).
Hemiprocne comata comata (Temminck).
Hemiprocne comata major (Hartert).

The genus of large collared swifts that commonly has been called *Hemiprocne* must, if generically separable from *Chaetura*, consequently be given a new name. Doctor Hartert in his most recent review of the swifts,† placed *Hemiprocne* as a synonym under *Chaetura*, claiming that the shape of the tail was not

* Zool. Illust. II, 1832, pl. 17 (type, *Hirundo longipennis* Rafinesque).

† Tierreich, 1, 1897, p. 71.

sufficient for its recognition as a different genus. However valid such a claim may be,—and it seems not to be so in this case,—there can be now no doubt of the propriety of generically segregating the group of swifts of which *Hirundo zonaris* Shaw may be considered the representative, because aside from its emarginate instead of square or rounded tail, it differs remarkably from *Chaetura* in the arrangement of the deep plantar tendons. Mr. F. A. Lucas has recently shown* that in *Hemiprocne zonaris*, the muscle which ordinarily flexes the front toes, the *flexor perforans*, instead of having its own tendon as is usual in the swifts, is attached to the muscle of the hallux, the *flexor longus hallucis*, and their common single tendon by means of four slips ultimately reaches and manipulates all the digits.

In view of all the above facts it seems proper to provide this group with a generic name, and **Streptoprocne**, from στρεπτός, *torquis*, and Πρόκνη, *Progne*, with *Hirundo zonaris* Shaw as the type, is suggested as appropriate. The species will therefore stand as follows:

Streptoprocne zonaris zonaris (Shaw).
Streptoprocne zonaris albicincta (Cabanis).
Streptoprocne zonaris pallidifrons (Hartert).
Streptoprocne biscutata (Sclater).
Streptoprocne semicollaris (Saussure).

* Auk, 1899, pp. 77-78.

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A NEW VOLE FROM MONTAGUE ISLAND, ALASKA.

BY WILFRED H. OSGOOD.

During a short time spent on Montague Island, Alaska, in the spring of 1905, Mr. Charles Sheldon, although chiefly interested in large bears, found time to "bother with mouse traps." As a result of this interest in small mammals as well as large, seven specimens of a vole and two of a shrew, prepared and presented by Mr. Sheldon, are now in the Biological Survey Collection. The shrews appear to be indistinguishable from the species of the adjacent mainland coast (*Sorex obscurus alascensis*), but the voles differ so widely as to require a new name. For the privilege of describing this new form, I am indebted to Dr. C. Hart Merriam, Chief of the Biological Survey.

Microtus elymocetes* sp. nov.

Type from the east side of Montague Island, Prince William Sound, Alaska. No. 137,323, U. S. National Museum, Biological Survey Collection. ♂ adult. May 12, 1905. C. Sheldon.

Characters.—Size very large, only equalled among the Alaskan members of the "*operarius* group" by *M. innuitus* of St. Lawrence Island; color most nearly like that of *M. yakutatensis* but underparts even more strongly suffused with brownish; feet dusky brownish instead of gray; skull large and heavy with zygomata strongly notched anteriorly.

Color.—Similar in general to that of *operarius*, *unalascensis*, and *kadiacensis*, but slightly darker with entire underparts heavily washed with buffy; upperparts cinnamon to clay color uniformly mixed with dusky, producing a general effect of raw umber; sides, face, and head essentially like back; underparts clay color, sometimes paling to grayish in pectoral and inguinal regions; forefeet dusky brownish, edged with whitish gray; hind feet grayish white proximally, dusky brownish distally; toes dusky brownish; tail sharply bicolor, dusky brownish above, whitish gray below.

Skull.—General characters as in *operarius*, *unalascensis*, and *yakutatensis*, but size very much larger; zygomata more deeply notched anteriorly; size

* *Elymocetes*, from *Elymus*, the generic name of the wild rye or beach grass often inhabited by this mouse and its relatives.

about as in *M. innuitus;* braincase narrower; rostrum shorter; width across lacrymal processes of frontal greater; audital bullae relatively smaller; upper incisors less projecting anteriorly.

Measurements.—The type and two topotypes, respectively: Total length, 201; 191; 180; tail vertebrae, 40; 40; 35; hind foot (dry), 23.5; 23; 22. Skull of type: Basal length, 31.1; basilar length, 29.2; postpalatilar length, 12.1; zygomatic width, 18.6; mastoid width, 13.8; length of nasals, 9.2; interorbital constriction, 3.9; maxillary toothrow, 7.4.

Remarks.—This insular form differs from its mainland relatives chiefly in decidedly larger size. It belongs to the so-called "*operarius* group" which properly includes, besides a number of Alaskan forms, several of wide distribution in Eurasia. Representatives of this group doubtless entered Alaska from Asia at a time not very remote, for although a number of Alaskan forms are now differentiated, all are very closely allied and none show any marked departure from the Asiatic forms. The one here described seems as worthy of specific rank as any of the others but the amount of cranial variation in all the forms and the general uniformity of coloration leads one to believe that they might well be ranked as subspecies. If this were done, however, *M. oeconomus*, *M. kamschaticus*, and probably *M. ratticeps* ought to be included as they differ from *M. operarius* and other Alaskan forms only very slightly.

Skulls of *Microtus operarius* Group.

99,373—*M. innuitus.* Type. 98,991—*M. operarius.* Topotype.
98,005—*M. yakutatensis.* Type. 107,472—*M. unalascensis.* Topotype.
137,323—*M. elymocetes.* Type.

Vol. XIX, pp. 73-82 June 4, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON A COLLECTION OF FISHES FROM THE ISLAND OF MINDANAO, PHILIPPINE ARCHIPELAGO, WITH DESCRIPTIONS OF NEW GENERA AND SPECIES.

BY HUGH M. SMITH AND ALVIN SEALE.

In 1903, through the courtesy of the Surgeon-General of the United States Army, a collection of fishes was obtained for the Bureau of Fisheries from the Rio Grande, on the island of Mindanao, Philippine Archipelago. The fishes were collected in October, 1903, by Dr. Morse, of the medical department of the Army, who was stationed at Cotabato, near the mouth of that stream, and all of the specimens were secured at or in the vicinity of that place.

The Rio Grande is a stream of considerable size which rises in the central part of the island and flows southwesterly toward Lake Liguasan; after receiving the outflow of this large lake it flows northwesterly and discharges through a delta into Illana Bay.

The collection is small and contains only 31 species, but these represent 20 families. Four of the species have not heretofore been described, and two of these are made the types of new genera. The native names of the species are given when known.

CHIROCENTRIDAE.

1. **Chirocentrus dorab** (Forskal).

One fine specimen, length, 19 inches. Head, 5.40; depth, 6.75 (without caudal); dorsal, 17; anal, 33. Color in spirits bluish above, sides and under parts silvery; axis of pectoral and its outer rays dusky.

DOROSOMATIDAE.

2. **Anodontostoma chacunda** (Hamilton).

"CABASHI."

Two specimens, length, 7.75 and 8 inches. Head, 3.45; depth, 2.50; posterior dorsal ray not prolonged. Color in spirits silvery, the back with about 6 longitudinal dusky lines; a brown spot above axis of pectorals; tip of anterior dorsal rays dusky; the interior rays of each caudal lobe with an indistinct dusky wash. These specimens represent the form called by Dr. Bleeker var. *selangkat*.

ENGRAULIDAE.

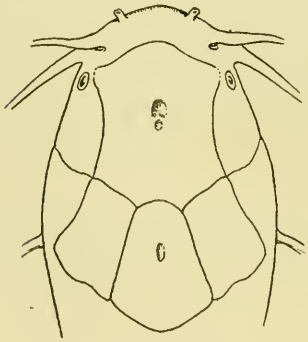
3. **Anchovia boelama** (Forskal).

Two specimens, length, 2.50 and 3.75 inches. Head, 3.75; depth, 4.10; dorsal, 14; anal, 33; scales, 34; snout projecting. Color in spirits silvery, bluish above; no silvery band; fins uniform.

CLARIIDAE.

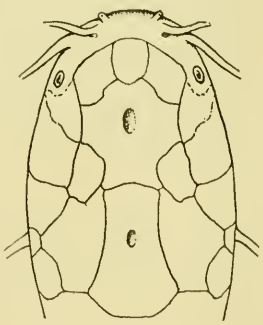
4. **Clarias gilli** Smith & Seale, sp. nov.

Head, 7; depth, 8.50 without caudal; vertical fins united to caudal; dorsal, 93; anal, 87; head with two fontanelles; barbules, 8, the lower maxillary and upper mandibular pairs very long, extending to middle of pectoral fin; teeth in jaws small, sharp-pointed; vomerine teeth small, rounded, in a somewhat crescent-shaped patch; top of head formed of 21 bony plates, three of which are anterior to the large plate bearing the anterior fontanelle; pectorals short, .5 head, their spines serrated; ventrals .33 head, their tip reaching to origin of anal; the vertical fins extend only about one-third the length of the caudal, to which they are



a

a. Clarias nieuhofi, after Bleeker.



b

b. Clarias gilli Smith & Seale.

firmly united; length of caudal equal to head; distance from origin of dorsal to tip of snout 3.90 in length without caudal; height of dorsal about 3 in head, the anal slightly deeper. Color in spirits uniform dull brown, with a slightly bluish tint; fins similar to body in color, except pectorals

and ventrals, which are yellowish. Two fine specimens, length, 12.75 and 13.50 inches.

This species resembles *C. nieuhofi* Valenciennes, but differs in the number and arrangement of the cephalic plates, in having but two fontanelles, and in coloration. For comparison, outline figures of the dorsal surface of the heads of these two species are here given.

Type, 12.75 inches long, from Rio Grande, Mindanao, No. 55,620, U. S. National Museum. Named for Dr. Theodore Gill.

SYNGNATHIDAE.

5. **Corythroichthys pullus** Smith & Seale, sp. nov.

Head, 8 in length without caudal; depth, 2.50 in head; snout, 2.20 in head, its width 4 in its length; eye, 2.50 in snout; dorsal, 29; anal, 1; pectoral, 14; osseous rings, 15 + 41; base of dorsal not elevated; angle of forehead not abrupt, being about 30°; no filaments on head; opercle crossed by a single bony stay; ventral surface of rings on belly and thorax with a sharp median ridge; dorsal ridge of trunk and tail not continuous; a low median ridge on top of snout, with small lateral ridge from orbit to tip of snout; length of pectorals 2.50 in snout; caudal 3 in snout; anal opening situated on the posterior body ring; the dorsal fin located on the 6 anterior rings of the tail; longest dorsal ray about 2.50 in snout. Color

Corythroichthys pullus Smith & Seale, sp. nov.

in spirits uniform dark lava brown, no black bands or spots anywhere on body; some indistinct pearl-colored spots on ventral surface of belly; a whitish line just below eye; an oblique dusky bar on lower part of opercles uniting under the throat; some lighter spots and reticulations on under part of head; dorsal with about four longitudinal rows of brown spots; pectorals and caudal gray.

This species resembles *C. tapeinosomus*, but differs in the location of anal opening and in various other characters.

One specimen, the type, 5.60 inches long, from the Rio Grande, Mindanao; No. 55,621 U. S. National Museum.

MUGILIDAE.

6. **Liza trocheli** Bleeker.

Nine specimens, 1.50 to 2.50 inches long. Head, 3.50; depth, 3. 20; dorsal, iv–i, 8; anal, iii, 8; scales, 32; preorbital toothed at end, but without notch; no adipose eyelid. Color uniform silvery gray.

SPHYRAENIDAE.

7. **Sphyraena obtusata** Cuvier & Valenciennes.

"CUMBUSAN"

One specimen, 9 inches long. Head, 3.10; depth, 6.50; dorsal, v, 19; anal, i, 11; scales, 83. Color in spirits dusky above, white below, scarcely a trace of dusky band on sides. Similar in every respect to other specimens from Cavite.

CARANGIDAE.

8. **Scomberoides tala** (Cuvier & Valenciennes).

"CASSISUNG."

One specimen, 11.75 inches long. Head, 4.60; depth, 3; dorsal, vii–i, 20; anal ii–i, 17; teeth on jaws, vomer, palatine, and tongue, some enlarged canines in jaws; maxillary extending behind posterior margin of eye. Color in spirits silvery, with bluish wash; several large vertical brownish blotches on sides; axis of pectoral with dark spot.

9. **Scomberoides toloo-parah** (Rüppell).

"CASSISUNG."

Five specimens, 5.50 to 10.75 inches long. Head, 4.50; depth, 4; dorsal, v–ii, 19; anal, ii, 20; maxillary ending under posterior third of eye; minute teeth on jaws, vomer, palatines and tongue. Color in spirits silvery, bluish above, tip of dorsal black.

10. **Caranx fosteri** (Cuvier & Valenciennes).

(*Caranx hippos* Günther.)

One specimen, length 5 inches. Head, 3.10; depth, 2.50 without caudal; dorsal, ix–i, 21; anal, ii–i, 17; 42 scales in curved portion of lateral line, 30 armed scutes in straight portion; the curved portion contained 1.18 in straight; breast scaled; teeth in upper jaw in villiform band with outer series of larger ones, teeth of lower jaw in single series; maxillary ending on a line with posterior margin of pupil, its distal width equal to pupil. Color in spirits uniform silvery, fins uniform yellowish white; a dusky spot in axis of pectoral; an indistinct opercular spot.

11. **Caranx carangus** (Bloch).

Sixteen specimens, length, 2.20 to 3.50 inches. Head, 2.80; depth, 2.18 without caudal; dorsal, vii–i, 20; anal, ii–i, 16; scales, 52; in curved portion of lateral line, 32 armed scales in straight portion; breast naked; maxillary ending on a line with posterior third of pupil.

This species resembles *C. fosteri*, but is easily distinguished by the naked breast; it is also a little deeper. Our specimens show no dusky bands but are uniformly silvery, the spinous dorsal grayish.

LEIOGNATHIDAE.

12. **Leiognathus dussumieri** (Cuvier & Valenciennes).

Five specimens, length, 1.50 to 3 inches. Head, 3; depth, 1.50; dorsal, viii, 16; anal, iii, 14; lateral line complete; breast naked; two small spines above anterior margin of eye. Color in spirits silvery; axis of pectoral dusky; fins unmarked.

13. **Leiognathus splendens** (Cuvier & Valenciennes).

One specimen, length 3.50 inches. Head, 3; depth, 2; dorsal, viii, 18; anal, iii, 14; lateral line incomplete. Color silvery, bluish above, a large black blotch occupying upper half of spinous dorsal.

14. **Gazza minuta** (Bloch).

Four specimens, length, 3.10 to 3.50 inches. Head, 3; depth, 2; dorsal, viii, 16; anal, iii, 14; lateral line incomplete; teeth like small canines; lower margin of preopercle denticulate. Color in spirits silvery; back with yellowish reticulating lines.

AMBASSIDAE.

15. **Priopis urotaenia** (Bleeker).

Eight specimens, length, 1.50 to 4.75 inches. Head, 2.50; depth, 2.50; scales, 30; two rows of scales on cheeks. Color in spirits yellowish white, a silvery line extending forward from base of caudal along middle of sides; membrane between second and third dorsal spines dusky. Similar in every respect to other numerous examples from Bacon, Sorsogon, P. I.

SERRANIDAE.

16. **Epinephelus bontoides** (Bleeker).

One fine specimen, length, 12.10 inches. Head, 2.45 without caudal; depth, 3; dorsal, xi, 15; anal, iii, 8; scales, about 88; interorbital less than eye; opercular spines equidistant; opercular flap pointed; enlarged serrae at angle of preopercle. Color in spirits light brownish, with scattered black dots over body about half the size of pupil.

LUTIANIDAE.

17. **Lutianus lineatus** (Quoy & Gaimard).

Two specimens, length, 7.50 and 11 inches. Head, 2.75; depth, 2.50; dorsal, x, 14; anal, iii, 8; scales about 50; teeth on tongue; preopercle scarcely notched, knob small; caudal truncate (broken); maxillary extending to below anterior half of eye. Color in spirits grayish; larger specimen more silvery; indistinct dusky oblique lines above lateral line, longitudinal ones below; all the fins grayish except pectorals, which are yellow.

18. **Lutianus malabaricus** (Bleeker).

Three specimens, length, 8.75 to 14.50 inches. Head, 2.50; depth, 2.45 without caudal; dorsal, xi, 14; anal, iii, 8; scales in lateral line, 52; no lingual teeth; caudal truncate; notch of preopercle shallow but wide and distinct, knob distinct; pectorals long, extending to base of anal. Color in spirits yellowish with indistinct oblique dusky lines above lateral line, longitudinal lines below; axis of pectorals dusky; a white spot on top of caudal peduncle scarcely showing in very old example; fins uniform yellowish white.

19. **Terapon jarbua** (Forskal).

"BUNGAO."

Two specimens, length, 6.75 and 7.75 inches. Head, 3.10; depth, 3.14; dorsal, xii, 10; anal, iii, 9; scales, 80. Color in spirits silvery, with three brownish longitudinal bands; dorsal with large black blotch; soft dorsal with two dusky blotches; oblique dusky bands on caudal. Similar in every respect to specimens from San Fabian, Pangasinan, P. I.

HAEMULIDAE.

20. **Pristipoma hasta** (Bloch).

Two fine specimens, length, 10.50 inches. Head, 2.90; depth, 2.80; dorsal, xii, 14; anal, iii, 7; scales, 52; gill-rakers, 12. These specimens represent the two forms *P. hasta* (Bloch) and *P. negeb* (Rüppell), which Dr. Day (Fishes of India, p. 746) unites under the name *P. hasta*. These specimens show no difference except in their markings; one represents the form with numerous small black dots forming irregular longitudinal lines, similar in every respect to *P. hasta* as figured by Bleeker (Atlas Ichthyologique, vol. 8, pl. cccxxv, fig. 3); the other represents the form with 8 vertical bands, as shown in Bleeker's figure (op. cit., pl. cccli, fig. 4), this specimen showing also numerous indistinct lines of dots as in *P. hasta*.

MULLIDAE.

21. **Upeneus vittatus** (Forskal).

"TIAUW."

Three specimens, length, 4.20 to 11 inches. Head, 3.18; depth, 3.20; dorsal, vii, 10; anal, i, 6; scales, 37; barbules, short. Color in spirits, yellowish, upper half of body with four dusky longitudinal lines; top of spinous dorsal dusky; an indistinct dusky band through its middle; soft dorsal with two indistinct dusky bands, each lobe of caudal with five or six oblique dusky bars; in the small examples the markings almost obliterated.

EPHIPPIDAE.

22. **Ephippus argus** (Gmelin).

One specimen, length, 10 inches. Similar in every respect to specimens from Cavite and Bacon, Sorsozon, P. I. Head, 3.50; depth, 1.75 without caudal. Color in spirits brownish with a wash of blue, scattered black dots over back and sides; ventral surface lighter.

TETRAODONTIDAE.

23. **Tetraodon patoca** Buchanan.

Six specimens, length, 1.50 to 2.50 inches. Head, 2.50; depth, 3; dorsal, 9; anal, 8; small prickles on back from interorbital space to a line with posterior axis of pectorals, and on belly from chin to near anal spine, other parts naked; a simple nonperforated nasal cavity with two membranous flaps. Color in spirits brownish above, whitish below, a dusky band on anterior interorbital space; another over back to base of pectoral fins, another at base of spinous dorsal; sides of body with large white spots; fins white; posterior half of caudal dusky.

ANABANTIDAE.

24. **Anabas scandens** (Daldorff).

Three fine specimens, length, 5 to 5.20 inches. Head, 3; depth, 2.60 without caudal; dorsal xviii, 7; anal, x, 9; scales in lateral line, 29; opercle and preopercle serrated; vomerine teeth. Color in spirits uniform dull brown.

OPHIOCEPHALIDAE.

25. **Ophiocephalus melanopterus** Bleeker.

"AMANU."

Three specimens, length, 8.75 to 14.50 inches. Head, 3; depth, 6; dorsal, 40; anal, 25; scales, 54. Color in spirits blackish brown, fins blackish, lower part of head and ventral surface of body whitish with dark brown spots. A large series of specimens will probably show *O. melanopterus* and *O. striatus* to be identical.

GOBIIDAE.

26. **Glossogobius giuris** (Buchanan).

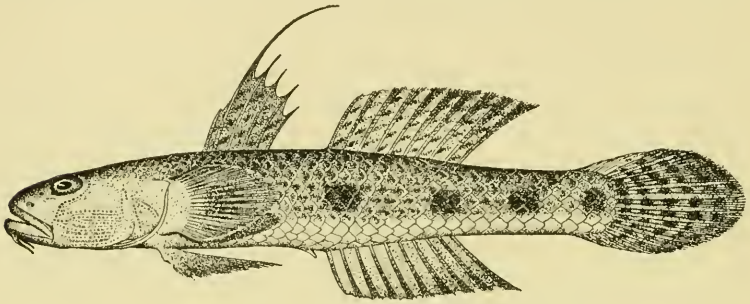
Eleven specimens, length, 2.10 to 7.75 inches. Head, 3; depth, 5.50; scales, 30; dorsal, vii, 9; anal, 9; tongue, forked; no canines; caudal rounded; about 20 rows of scales in front of dorsal; ten rows between origin of the dorsals. Color in spirits yellowish brown with about 5 indistinct dusky bands over back which alternate with dusky blotches on sides; dorsals and caudal with rows of black dots; pectorals usually with two dusky blotches on base; ventrals and anal usually yellow, but in some specimens slightly washed with dusky. In general form and color this species resembles *G. brunneus* of Japan; the Japanese form, however, always has black spots on nuchal region.

Illana Smith & Seale, gen. nov. (*Gobiidæ*).

This genus is characterized by the presence of two distinct barbules on the chin; teeth in jaws in two series, the outer ones in each jaw enlarged, canine-like; no teeth on vomer, palatines, or tongue; ventrals united; head naked and broad; tongue emarginate. Type, *Illana cacabet.*

27. **Illana cacabet*** Smith & Seale, sp. nov.

Head, 3.75; depth, 6 in length without caudal; dorsal, vi, 10; anal, 10; a series of eight scales between origin of soft dorsal and anal; scales, 30 from upper margin of opercle to end of vertebrae; snout, 3.20 in head; interorbital less than eye. Body moderately elongate, compressed; snout rather rounded, the lower jaw slightly the longer; width of head, 1 30 in its length, its depth 2 in its length; cheeks fat, the lower half of cheek crossed by 5 or 6 longitudinal lines of minute warts, with one or two oblique rows at each end of these lines, probably the openings of mucous pores; tongue



Illana cacabet Smith & Seale, sp. nov.

rather deeply emarginate; teeth small, with the outer row in each jaw enlarged, canine-like; maxillary ending on a line with anterior margin of eye; chin with two barbules about equal in length to diameter of eye; a shallow longitudinal groove in nuchal region extending to snout; head without scales; scales of body adnate, those of nuchal region small, about 15 in front of dorsal, a series of 10 between the origins of the dorsals; spinous dorsal with the second spine elongate, in males extending to or beyond middle of soft dorsal; longest dorsal ray, 1.60 in head; pectorals, 1.10 in head; ventrals, 1.35 in head; origin of anal fin midway between tip of snout and base of caudal; anal papilla distinct; base of anal, 1.20 in head its longest ray 1.75 in head; caudal rounded, 1.10 in head.

Color in spirits yellowish below, brown above, with about three indistinct dusky bands over back and 5 dusky blotches along the sides, one at base of caudal, one on middle of caudal peduncle, one under posterior of soft dorsal, one under anterior of soft dorsal, and the anterior one under the anterior half of spinous dorsal; no bluish marking or spot on shoulder; two or three irregular brown lines connecting these blotches more or less; some irregular fine brown dots and lines on head and cheeks; dorsal fins with rows of brown dots forming oblique lines, less distinct on spinous dorsal; caudal with brown vertical bands, the four upper rays white at base; pectorals, ventrals, and anal bluish.

Three specimens, length, 3 to 3.25 inches. The type is a male, length 3.25 inches, from the Rio Grande in Mindanao, No. 55,622, U. S. National Museum.

* Cacabet is a Philippine name for the goby.

Gobius cyanosomus Bleeker probably belongs to this genus, but is a different species, as seen by the presence of the lines of warts on cheeks of our specimens, and the different color markings. In *G. cyanosomus* the jaws are said to be equal, in our specimens the lower jaw is a little the longer.

28. **Glossogobius biocellatus** (Cuvier & Valenciennes).

Two specimens, length, 2 inches. We refer these examples to this species with considerable doubt, owing to their mutilated condition. Head, 3.25; depth, 6.50; dorsal, vi, 10; anal, 9; scales, about 26; tongue forked. Color in spirits brownish with indistinct darker lines; ventral and anal fins bluish; spinous dorsal with dusky blotch; soft dorsal with rows of brown spots.

29. **Acentrogobius acutipinnis** (Cuvier & Valenciennes).

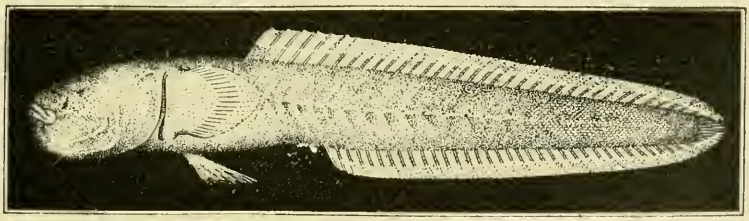
One specimen, length, 2 inches. Head, 3.45; depth, 4.75; dorsal, vi, 10; anal, 12; scales, 23; anterior dorsal spines filiform, nuchal region unscaled; Color in spirits yellowish with about 7 irregular bands over back forming blotches on sides; a blue line from eye to angle of mouth; another from eye to posterior margin of opercle. The dorsal spines in our example are much longer than in the specimen figured by Dr. Day.

Caragobius Smith & Seale, gen. nov. (*Gobiidae*).

Posterior third of body well scaled, head and anterior two-thirds naked; head large, oblong, quadrilateral; lower jaw heavy; a single row of small, sharp, curved canine teeth in each jaw, no enlarged canines; eyes entirely covered with skin; no barbules; tongue rounded, inconspicuous; gill-openings straight, vertical, restricted; a small pore above each gill-opening which opens into a cavity separate from gill-cavity; dorsal fins continuous, long and low; ventrals fully united. This genus is related to *Trypauchen* Cuvier & Valenciennes, but is distinguished by the differences in squamation, teeth, eyes, etc. Type, *Caragobius typhlops.*

30. **Caragobius typhlops** Smith & Seale, sp. nov.

Head, 5 in length without caudal; depth, 2; snout, 3.75 in head; dorsal, vi, 30; anal, 34; scales on posterior third of body only. Body elon-



Caragobius typhlops Smith & Seale, sp. nov.

gate, compressed; the head large, quadrangular, its depth slightly greater than width, the width 1.45 in its length; lower jaw heavy, the cleft of

mouth directed obliquely upwards; maxillary 3 in head measured to symphysis; a single row of about 14 sharp curved teeth in each jaw; no teeth on vomer, palatines, or tongue; tongue small, rounded; eyes rudimentary and covered with skin; gill-opening restricted to sides, the isthmus very broad; a small pore or slit on nuchal region just above gill-slit opening into a pit or cavity separate from gill-cavity; head naked, with numerous mucus pores; a depression midway between eye-pit and upper posterior margin of opercle in which a roughened bony surface is exposed; no scales except on posterior third of body, which is well scaled, about 12 series between dorsal and anal at anterior portion of squamation; vertical fins not enveloped in skin; dorsals connected, the entire fin low, its origin on a line with posterior third of ventral rays, the posterior rays continuous with caudal; anal fin long, confluent with caudal, its rays short, its origin below the last dorsal spine; anal papilla very prominent; pectoral base very broad; ventrals 1.95 in head, united, the anterior portion forming a cup-shaped disk. (In all the specimens the fins, the ventrals excepted, are mutilated and a full description is impossible.) Color in spirits uniform yellowish white.

Five specimens, length, 2 to 2.25 inches. Type, 2.25 inches long, from the Rio Grande, Mindanao; No. 55,619, U. S. National Museum.

SOLEIDAE.

31. **Achirus thepassii** Bleeker.

One specimen, length, 2 inches. Depth, 2.30 without caudal; no pectorals; interorbital narrow; dorsal, 69; anal, 48; scales, 89. Color in spirits yellowish with dark dots and blotches; rows of fine dots on fins.

VOL. XIX PP. 83-86 JUNE 4, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWELVE NEW GENERA OF BATS.

BY GERRIT S. MILLER, JR.

By permission of the Secretary of the Smithsonian Institution.

Having recently examined some of the more important European collections of *Chiroptera* in connection with the material in the United States National Museum, I find that the following genera have not hitherto been described.

Niadius gen. nov. (*Pteropidæ*).

Type.—*Cynopterus princeps* Miller.

Characters.—Like *Cynopterus* but with the larger cheek-teeth broader and more squarish in outline; crown of pm_4 and m_1 with distinct terete cusp slightly in front of middle of crushing surface.

Species.—*Niadius princeps* (Miller).

Remarks.—In the increased size of the larger cheek-teeth this genus approaches *Thoopterus;* but the terete cusp in pm_4 and m_1 differs conspicuously from the ridge which occupies somewhat the same position in the related group.

Sphærias gen. nov. (*Pteropidæ*).

Type.—*Cynopterus blanfordi* Thomas.

Characters.—Like *Cynopterus* but without calcar and external tail; incisors more developed than in any of the related genera, the series of the lower jaw forming four conspicuous serrations when viewed from in front, those of the upper jaw with sharp-edged crown well differentiated from shaft and provided with a large main cusp near middle.

Species.—*Sphærias blanfordi* (Thomas).

Remarks.—This genus was included in *Thoopterus* by Matschie* but it is readily distinguishable by the small (normal) cheek-teeth, the absence of the calcar and external tail, and the very peculiar, trenchant form of the incisors.

*Flederm. des Berl. Mus. für Naturk., p. 77, 1899.

Macroderma gen. nov. (*Megadermidæ*).

Type.—Megaderma gigas Dobson.

Characters.—Differing from *Megaderma* and *Lyroderma* in the absence of the small upper premolar (pm^2), in the peculiar character of the interorbital expansion, the development of which is intermediate between that in the Asiatic and African members of the group, and in the much greater development of the cartilaginous premaxillaries.

Species.—Macroderma gigas (Dobson).

Ardops gen. nov. (*Phyllostomidæ*).

Type.—Stenoderma nichollsi Thomas.

Characters.—Like *Stenoderma* but rostrum not depressed between supraorbital ridges; anterior nares directed chiefly forward; incisive framina not separated by any appreciable space from roots of incisors; supraorbital ridges angled at middle; inner upper incisor with length of crown nearly equal to height; and m^1 and m^2 without metaconule.

Species.—Ardops nichollsi (Thomas), *A. montserratensis* (Thomas), and *A. luciæ* (Miller).

Erophylla gen. nov. (*Phyllostomidæ*).

Type.—Phyllonycteris bombifrons Miller.

Characters.—Like *Phyllonycteris* but interfemoral membrane extending to short though evident calcar; noseleaf with pointed median projection; zygomatic arches complete; and lower molars with distinct cutting edge.

Species.—Erophylla bombifrons (Miller), *E. planifrons* (Miller), *E. sezekorni* (Gundlach) and *E. santacristobalensis* (Elliot).

Diæmus gen. nov. (*Desmodontidæ*).

Type.—Desmodus youngi Jentink.*

Characters.—Like *Desmodus*, but thumb only about one-eighth as long as third finger, the two pads on its under surface coalesced; inner lower incisor trilobate, with large median lobe, a minute inner lobe near tip and an equally small outer lobe near base.

Species.—Diæmus youngi (Jentink).

Dirias gen. nov. (*Noctilionidæ*).

Type.—Noctilio albiventer Spix.

Characters.—Like *Noctilio* but with leg and foot less elongated (equal to about 40 per cent of total length); m^1 and m^2 with very large hypocone connected by a high conspicuous commissure with commissure extending from protocone to metacone.

Species.—Dirias albiventer (Spix).

*As represented by a specimen from Roca Nova, Parana, Brazil (No. 140,769, U. S. National Museum; A. Robert, collector).

Phodotes gen. nov. (*Natalidæ*).

Type.—Natalus tumidirostris Miller.

Characters.—Like *Natalus*, but maxillaries conspicuously inflated and translucent, the swollen region concealing molar teeth when skull is viewed from above.

Species.—Phodotes tumidirostris (Miller).

Pizonyx gen. nov. (*Vespertilionidæ*).

Type.—Myotis vivesi Menegaux.

Characters.—Like *Myotis* but with foot (claws included) as long as tibia, the toes and claws so greatly compressed that width of claw is only about one-eighth the height at base; wing with large glandular mass near middle of forearm.

Species—Pizonyx vivesi (Menegaux).

Rhinopterus gen. nov. (*Vespertilionidæ*).

Type.—Glauconycteris floweri de Winton.

Characters.—Externally like a small *Vespertilio*, but upper surface of forearm, tail, and tibia thickly sprinkled with pointed, horny excrescences resembling those on edge of ear in some *Molossidæ*, but larger. Skull differing from that of *Vespertilio* in the much greater relative breadth of anterior portion of braincase, shorter, lower rostrum, and in the form of the upper toothrows, which are more concave on inner side and more convergent anteriorly.

Species.—Rhinopterus floweri (de Winton).

Bæodon gen. nov. (*Vespertilionidæ*).

Type.—Rhogeëssa alleni Thomas.

Characters.—Like *Rhogeëssa* but with reduction of outer lower incisor carried so far that the tooth has become to a mere functionless spicule less than one-twentieth as large as first or second incisor, nearly concealed beneath cingulum of canine.

Species.—Bæodon alleni (Thomas).

Eumops gen. nov. (*Molossidæ*).

Type.—Molossus californicus Merriam.

Characters.—Like *Molossus* but skull slender, with hour-glass shaped or nearly cylindrical interorbital region and no distinct sagittal crest; palate slightly arched but not domed; upper incisor with slender, curved shaft higher than length of crown; lower incisors, 2–2; upper premolars, 2–2, the small tooth (pm^2) normally well formed and not deciduous; first and second upper molars with well developed hypocone.

Species.—Eumops abrasus (Temminck), *E. bonariensis* (Peters), *E. californicus* (Merriam), *E. glaucinus* (Wagner), *E. maurus* (Thomas), *E. milleri* (J. A. Allen), *E. nanus* (Miller), *E. orthotis* (H. Allen), *E. perotis* (Wied), and *E. trumbulli* (Thomas).

Vol. XIX, pp. 87-90 June 4, 1906

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

SMITHSONIAN INSTITUTION LIBRARIES

IDENTITY OF *EUTAMIAS PALLIDUS* (ALLEN), WITH A DESCRIPTION OF A RELATED FORM FROM THE SOUTH DAKOTA BAD LANDS.

BY MERRITT CARY.

A careful study of the chipmunks commonly known as *Eutamias minimus* in the collection of the Biological Survey and the U. S. National Museum has brought to light some interesting facts in regard to their interrelations and distribution. The above material is rich in specimens from northern Wyoming and southern Montana, and proves conclusively that *Tamias quadrivittatus pallidus* Allen is a valid species. A related form from South Dakota Bad Lands is described as new.

Eutamias pallidus (Allen).

Tamias quadrivittatus pallidus Allen, Proc. Bost. Soc. Nat. Hist., XVI, p. 289, 1874.

Tamias minimus Allen, Bull. Am. Mus. Nat. Hist., III, p. 110, 1890 (part)—not of Bachman, 1839.

General characters.—Similar in coloration to *E. minimus*, but much larger; hind foot about 33 mm. (instead of 30); tail nearly 100 mm.

Color.—A specimen from Camp Thorne, Montana (No. 11,656, U. S. N. M., July 18, 1873), agrees very well in color with early August examples of *minimus* from Green River. Comparable chipmunks (fresh postbreeding pelage) from other localities in the Yellowstone region (Powderville, Alzada, and Painted Robe Creek) have the sides more heavily washed with ochraceous.

Cranial characters.—Skull relatively much larger and heavier than in *E. minimus*, the zygomata more abruptly spreading; anterior portion of nasals broad; audital bullae larger and more inflated.

Measurements.—A very large female from Painted Robe Creek, Montana: Total length, 220; tail vertebrae, 104; hind foot, 34. Two males from the same locality, not fully adult: 204; 92; 32; and 205; 94; 33; respectively. A specimen from Powder River Basin, Wyoming, 222; 106; 34. The hind

foot of the Camp Thorne specimen (relaxed from dry skin) measures 32, a millimeter less than the average. Average of four adult males of *E. minimus* from Green River, Wyoming: Total length, 188 (180–195); tail vertebrae 87 (80–92); hind foot, 30.

The skull of the large female from Painted Robe Creek, Montana, measures: Occipito-nasal length, 34.3; basilar length of Hensel, 26.5; zygomatic breadth, 19.1; greatest breadth of braincase, 16.8. Another skull from the same locality measures: 32.1; 24.4; 18.5; 16.5. A large skull from Powder River Basin, Wyoming: 32.9; 24.8; 18.2; 16.5. Average of four skulls of *minimus* from Green River: Occipito-nasal length, 30.3; basilar length of Hensel, 23.1; zygomatic breadth, 17; greatest breadth of braincase, 15.4.

Remarks.—Chipmunks from the following localities agree well with the Camp Thorne specimen,* assumed to be typical:—*Montana:* Painted Robe Creek, Sage Creek (Big Horn Basin), Alzada, Powderville. *Wyoming:* Powder River Basin, Merino, Moorcroft, Thornton, Newcastle, Douglas, Big Horn Basin. Chipmunks from Fort Washakie and Wind River Basin average somewhat smaller, but agree in coloration; while others from the Pine Ridge country of northwestern Nebraska (Warbonnet Canyon and Glen, Sioux County, Coll. Univ. of Nebr.) are intermediate in coloration between typical *E. pallidus* and the pale Bad Lands form which is described later in the present paper. The much larger size and longer tail of *pallidus* serve at once to distinguish it from the small *minimus*. Intergradation can not be shown from present material and with such a discrepancy in size it seems best to give *pallidus* full specific rank. Green River City, Wyoming, has been commonly accepted as the type locality of *minimus*,† but Townsend's Narrative‡ seems to place it considerably north of that point, and not far from the mouth of Big Sandy Creek.

In the original description of *E. pallidus* (l. c.), Doctor Allen gave its habitat as "The Great Plains, and the desert region generally of the interior of the continent." In a footnote it is characterized as "The small, pale form of the high, dry plains of the interior." No type specimen was designated, nor was a type locality assigned. In a later paper,§ however, Doctor Allen gave a more detailed characterization, and remarked (p. 796) that *pallidus* "Reaches an extreme phase of specialization in the Yellowstone region in respect to both pallor and smallness of size. He still further restricted *pallidus* to the Yellowstone region by the following words (p. 800): "typical *pallidus* (from the Yellowstone Plains)." Among the specimens listed by Doctor Allen were three taken by himself at Camp Thorne, Yellowstone River, July 18, 1873. These are the only specimens from a definite locality in the Yellowstone region which he considered "very pale." As one of the above specimens (No. 11,656, U. S. N. M.) is still extant, and in a good state of preservation, it seems best to consider Camp Thorne the type locality.

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*The site of Camp Thorne is near the present town of Glendive, Montana.

† Cf. Allen, Bull. Am. Mus. Nat. Hist., III, p. 112, 1890.

‡ Narr. Journey across Rocky Mts., etc., p. 72, 1839.

§ Mon. N. Am. Rodentia, p. 795, 1877.

Eutamias pallidus cacodemus subsp. nov.

BAD LANDS CHIPMUNK.

Tamias minimus Allen, Bull. Am. Mus. Nat. Hist., III, p. 110, 1890 (in part, specimen from "Mauvaises Terres").

Type from Sheep Mountain, Big Bad Lands, South Dakota. No. 138,137, U. S. National Museum, Biological Survey Collection. ♂ adult. Collected September 2, 1905, by Merritt Cary. Original number, 682.

General characters.—Size a trifle larger than *pallidus;* coloration much paler; tail very long.

Cranial characters.—Skull similar to that of *pallidus,* but slightly larger and heavier.

Color.—Breeding pelage (May and June): Median dorsal stripe blackish, with a slight admixture of ochraceous; lateral stripes pale ochraceous buff, with an olivaceous tinge. Dorsal pair of light stripes cream gray, lateral pair white. Facial stripes pale buffy ochraceous. Ears pale, lacking ochraceous of fall specimens. Forehead gray. Sides and back of neck, sides of body and flanks grayish white, with a trace of buff. Feet and rump grayish white, underparts pure white. Under surface of tail cream color, with a narrow black submarginal band; side hairs tipped with white. Hairs on upper surface of tail broadly white at base, then banded with black, and apically white, producing a mixed black and white effect.

A June male from Corral Draw (No. $\frac{2}{7}\frac{2}{5}\frac{4}{5}\frac{9}{5}$, Coll. Am. Mus. Nat. Hist., June 9, 1894, W. W. Granger) is commencing to assume the fresh autumn coat on head and shoulders; while the back and rump present the extreme phase of worn winter pelage, being faded and bleached until the stripes are scarcely discernible. *Fresh postbreeding pelage* (August and September): Median dorsal stripe dark tawny ochraceous, becoming blackish toward rump; lateral stripes tawny ochraceous. Dorsal pair of light stripes grayish white; lateral pair broader, pure white. Dark facial stripes ochraceous, weakly indicated in palest examples. Anterior portion of ears bright ochraceous. Forehead mixed gray and ochraceous, or plain gray. Postauricular spots large and white. Sides and back of neck (except dorsal stripe), sides of body, and flanks washed with creamy buff, or a very pale ochraceous in darkest individuals. Upper surfaces of feet grayish white to creamy white. Under surface of tail varying from clay color to cream buff, the black submarginal band narrow. Hairs on upper surface of tail basally and apically cream buff, the median zone black.

Comparable specimens of *E. pallidus* in postbreeding pelage have the sides more strongly ochraceous, the dorsal and lateral stripes much darker, and the under surface of tail ochraceous.

Measurements.—Average of four adult males from type locality: Total length, 216.5 (210–225); tail vertebrae, 103.3 (97–110); hind foot, 34.5 (34–35). Type: Total length, 210; tail vertebrae, 100; hind foot, 34. Average cranial measurements: Occipito-nasal length, 32.5; basilar length of Hensel, 24.9; zygomatic breadth, 18.4; greatest breadth of braincase, 16. Type: 32.3; 24.4; 17.6; 15.6.

Specimens examined.—Total number, 32, all from South Dakota, as follows:

Corral Draw (near Sheep Mountain) 12 (Coll. Am. Mus. Nat. Hist., W. W. Granger); Cheyenne River Bad Lands 12, and "Mauvaises Terres" 1 (Coll. U. S. Nat. Mus., L. Stejneger and F. V. Hayden, respectively); Sheep Mountain 7 (Biol. Surv. Coll., Merritt Cary).

Remarks.—So far as at present known, this beautiful chipmunk, which is by far the palest member of the genus, occurs only in the Big Bad Lands of western South Dakota, and the Hat Creek Basin Bad Lands of extreme northwestern Nebraska*—the *Mauvaises Terres* of the French voyageurs. The extreme pallor of coloration is manifestly due to environment. The white, alkaline soil, which supports scarcely a vestige of vegetation over large areas, exerts a strong bleaching effect upon the few mammals restricted to the Bad Lands. The most marked instance of this among mammals, aside from chipmunks, is *Neotoma rupicola*, the palest wood-rat, which occurs only among the Bad Lands.

*While collecting in the Hat Creek Basin in 1901, the writer often saw very pale chipmunks in the Bad Lands of that region, but unfortunately collected no specimens.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW CRAB FROM DOMINICA, WEST INDIES.

BY MARY J. RATHBUN.

By permission of the Secretary of the Smithsonian Institution.

Among a number of crustaceans sent to the United States National Museum by Mr. A. Hyatt Verrill, for determination, there is a new species of Catometopa, as follows:

Pseudorhombila octodentata sp. nov.

Type.—Male, dried. Dominica. A. Hyatt Verrill, collector. Cat. No. 32,690, U. S. National Museum.

Characters.—Carapace very convex fore and aft, regions indistinctly defined, surface closely set with flattened granules. Front subtruncate, a V-shaped median notch, a rounded lobe at outer angle. Antero-lateral teeth four (orbital angle excluded); the first small, separated from the orbit by a long straight interval; second tooth widest, third and fourth most acute, the third the larger, the fourth the most projecting.

Left cheliped missing; right one strong, covered with fine reticulated granulation; merus projecting little beyond the body, a strong subterminal tooth above; carpus subquadrate, with a conspicuous tooth at inner angle, and the outermost portion tuberculate; palm nearly twice as long as high, widening distally; dactylus as long as palm; both fingers strongly deflexed, not gaping, tips curved and overlapping.

Ambulatory legs long and narrow; meral joints granulate above and below, carpal joints above; some small superior spines on the merus. Dactyli with two fringes of long hair.

The second segment of the abdomen leaves exposed a large piece of the sternum on either side; third to fifth segments fused.

Measurements.—Length, 33.3; width, 46.1; fronto-orbital width, 24.7; width of front, 12.9; length of propodus of right cheliped, 39; length of merus of third ambulatory leg, 26.5 mm.

Remarks.—This species is very like *P. quadridentata* (Latreille) Milne Edwards,* a cotype of which is in the United States National Museum, but the latter has a more uneven carapace, fewer antero-lateral teeth in the male, and a longer postero-lateral margin.

* Hist. Nat. Crust., II, 59, 1837.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW QUERQUEDULA.

BY HARRY C. OBERHOLSER.

A single specimen of a teal from Lake Titicaca, Peru, some time since acquired by the United States National Museum, appears to belong to an undescribed species which may be called

Querquedula orinomus sp. nov.

Chars. sp.—Similar to *Querquedula cyanoptera*, but very much larger; rump and upper tail-coverts considerably barred with buff or ochraceous; chin without a trace of blackish. (In *Querquedula cyanoptera* the chin is rarely, if ever, entirely without a suffusion of blackish, and usually has much of this; the rump and upper tail-coverts have little if any indication of light bars, sometimes none.)

Description.—Type, adult male, No. 150,110, U. S. N. M.; Puna, Lake Titicaca, Peru; altitude 12,550 feet; A. J. Norris. Head, neck all around, upper back, scapulars, and all the lower parts excepting the under tail-coverts rich red brown, between chestnut and burnt sienna, duller on the abdomen; center of crown and forehead black, the upper back, scapulars, and flanks spotted and irregularly barred with black; back, rump, and upper tail-coverts olive brown, rather lighter on the upper tail-coverts, and everywhere with broad edgings and irregularly crescentic, often imperfect, bars of paler on at least the terminal portion of the feathers, these bars broad and chestnut or rufous on middle back, almost obsolete or reduced to median spots on upper rump and lower back, narrow and buff or ochraceous on lower rump and superior tail-coverts; central tail-feathers olive brown, the others fuscous, and all narrowly margined externally with buffy, the outermost with ochraceous; lower tail-coverts brownish black with a purplish tinge and somewhat mixed with chestnut; primary quills and primary coverts fuscous with a greenish sheen on exposed portions; secondaries fuscous narrowly tipped with whitish, their exposed portions (the distal part of outer webs) bright metallic grass green; greater-coverts with a wide terminal band of white; lesser and median coverts light grayish blue; lining of wing grayish brown externally, pure white internally.

This giant edition of *Querquedula cyanoptera* apparently represents that species in the region about Lake Titicaca, if not also throughout the Andean plateau, to which, however, it is probably confined. It needs comparison

with no other species, and bears much the same relation to *Q. cyanoptera* that *Querquedula puna* does to *Q. versicolor*. Strangely enough, *Querquedula cyanoptera*, despite the vastness of its range,—from British Columbia to the Falkland Islands,—seems to be indivisible into races, since there is no difference that we can discover in either size or color between birds from the United States and those from Chile or the Argentine Republic.

The great contrast in size that characterizes this new species is evident from the following millimeter measurements of adult males:

Querquedula orinomus.

Locality.	*Date.*	*Wing.*	*Tail.*	*Exposed culmen.*	*Tarsus.*	*Middle toe.*
Puna, Lake Titicaca, Peru . .	. . . . .	219	95	46	36 5	47

Querquedula cyanoptera.

Locality.	*Date.*	*Wing.*	*Tail.*	*Exposed culmen*	*Tarsus*	*Middle toe.*
Conchitas, Buenos Aires, Argentine Republic	October, 1867	191.	77	43.5	34.	42.
Santiago, Chile	June, 1864	190.5	81	45 5	33.	42 5
" "	October, 1862	194.5	82	43.	32.5	41.
Seven Wells, Salton River, Lower California	April 13, 1894	186.	76	44.5	34.	42.
Colorado River, Sonora . . .	March 25, 1894	194.	75	44.	32.	43
Average		191.2	78.2	44.1	33.1	42 1

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

GENERAL NOTES.

ON *MEPHITIS OLIDA* BOITARD.

In "General Notes" of this publication (1906, p. 45) Mr. A. Howell has objected to the employment of the name *Mephitis olida* Boitard in the Check List of Mammals, and argues that *putida* Boitard is the correct one to be adopted. This last name was rejected in the work above cited because *putida* Cuvier is indeterminable, therefore has no standing and may not be employed. In support of this view of the case, reference was made in a footnote to Dr. J. A. Allen's unanswerable argument in his paper published in these Proceedings (1902, p. 66), which Mr. Howell seems to have overlooked or forgotten. Until he is able to controvert successfully Dr. Allen's criticism, *olida* Boitard for the eastern skunk is likely to stand.

—*D. G. Elliot.*

CHANGE OF NAME.

My attention has just been directed by Prof. Theo. D. A. Cockerell to the fact that in my "Fossil Plants of the Judith River Beds" (Bull. U. S. Geol. Surv., No. 257, 1905, p. 143, pl. XVII, fig. 6) my *Quercus montana* is a homonym of the living *Q. montana* Willd., Sp. Pl., 1805. This requires that the fossil species be given a new name and I propose for it the designation **Quercus Hatcheri**, in honor of the late Prof. J. B. Hatcher, who was present when it was collected.—*F. H. Knowlton.*

TYPE OF THE GENUS *PRONOLAGUS.*

In my Classification of the Hares and their Allies (Smithsonian Miscell. Coll. XLV, p. 416, June 15, 1904) I based the description of the genus *Pronolagus* on the skeleton of a hare from South Africa, No. 22,972, United States National Museum, erroneously identified as *Lepus crassicaudatus* Geoffroy and designated that species as the type of the new genus. Messrs. Thomas and Schwann (Proc. Zool. Soc. London, 1905, Vol. I, pp. 272–5, pl. XVI, August 10, 1905) have shown that the specimen I called *Pronolagus crassicaudatus* (Geoffroy) is an example of *Pronolagus ruddi* Thomas and Schwann, so that the type of the genus *Pronolagus* should stand as *Pronolagus crassicaudatus* Lyon (not Geoffroy) = *Pronolagus ruddi* Thomas and Schwann.—*Marcus W. Lyon, Jr.*

NEW NAMES FOR TWO RECENTLY DESCRIBED GENERA OF PLANTS.*

Through the kindness of Oswald H. Sargent of York, West Australia, my attention has been called to the fact that my *Harperia* is a homonym, Mr. W. V. Fitzgerald having recently published the name for a new genus of Baloskionaceae. His description appeared in the first number of a new journal started in West Australia. This journal, of which only one part seems to have been issued, has been overlooked by me, as by the International Catalogue of Scientific Literature and the Botanisches Centralblatt. For the name *Harperia* a substitute is proposed such as to conform to botanical usage and still to carry out my desire to honor the collector, Roland M. Harper. This genus belongs to the Apiaceae or Umbelliferae.

The name *Donnellia* was used for a genus of mosses more than twenty-five years ago, which of course precludes the use of it as recently proposed by Mr. C. B. Clark for a genus of Commelinaceae. The substitute for this name is likewise so chosen as still to commemorate the name of Captain John Donnell Smith, who has done such admirable work on the Central American flora.

Harperella Rose.

Harperia Rose, Proc. Nat. Mus. **29**: 441. 1905, not *Harperia* Fitzgerald, Journ. West Australian Nat. Hist. Soc. [1]: 34. 1904.

Harperella nodosa Rose.

Harperia nodosa Rose, Proc. Nat. Mus. **29**: 441. 1905.

The type sheet is No. 514,914 in the U. S. National Herbarium.

Heretofore this species has been known only from two localities in Georgia. In 1905 Mr. Harper discovered the plant at two stations in Alabama as follows:

Rocky bed of Town Creek on Sand Mountains near Chavres, De Kalb County, November 24, 1905 (No. 8).

Rocky bed of Little River on Lookout Mountain, De Kalb County, November 25, 1905 (No. 14).

Neodonnellia Rose.

Donnellia Clark, Bot. Gaz. **33**: 261. *pl. 11*, not *Donnellia* Austin, Bull. Torr. Club **7**: 15. 1880.

Neodonnellia grandiflora (Donnell-Smith) Rose.

Callesia grandiflora Donnell-Smith, Bot. Gaz. **31**: 125. 1901.

Donnellia grandiflora Clark, Bot. Gaz. **33**: 261. *pl. 11*. 1902.

—*J. N. Rose.*

A BAT NEW TO THE UNITED STATES.

Dr. C. Hart Merriam has recently submitted to me for identification a leaf-nosed bat taken by Mr. Philip Waughtall in the Chiricahua Mountains, eight miles west of Paradise, Arizona, August 17, 1904. The specimen (No. 134,442, United States National Museum, Biological Survey collection) represents a species and genus, *Choeronycteris mexicana* Tschudi, not hitherto found in the United States.—*Gerrit S. Miller, Jr.*

* Published with the permission of the Acting Secretary of the Smithsonian Institution.

AMMOMYS AND OTHER COMPOUNDS OF *MYS.*

In a paper "On the Generic Arrangement of the Australian Rats hitherto referred to *Conilurus*," Thomas has established a new genus under the name *Ammomys*, taking as type *Mus hirsutus* Gould (Ann. & Mag. Nat. Hist., 7th ser., XVII, p. 84, Jan., 1906). *Ammomys* was originally proposed as a generic name 75 years ago by Bonaparte, who applied it, in 1831, to the pine mouse of the United States now placed in the subgenus *Pitymys*. It is consequently not available for any other group and especially for a second genus in the same family. The group of Australian jerboa-rats of which *M. hirsutus* is the type and which Thomas has shown to be closely related to *Notomys* may therefore be known as **Mesembriomys*** in allusion to its southern habitat.

In my "Index Generum Mammalium" (N. Am. Fauna, No. 23, p. 55) I listed about 350 compounds of μῦς which had been published prior to 1904, and called attention to the fact that nearly eight per cent of all the generic names of mammals were compounds of this word. A number of additions have since been made to the list so that the total number is now probably not far from 400. The effort to coin names with reference to some special meaning has been responsible for several cases of duplication and also for several terms of identical meaning as *Ammomys* and *Psammomys* for sand mouse, *Pitymys* and *Pinemys* for pine mouse, and *Notomys* and *Notiomys* for southern mouse. Although the number of possible compounds has by no means been exhausted, it is evident that the chances of duplication are very great and hence it is important to take every precaution to ascertain before publication whether proposed names have already appeared in print.—*T. S. Palmer.*

* μεσημβρία, south; μῦς, mouse.

Vol. XIX, pp. 99-100 July 30, 1906

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF THREE NEW MANGROVE CRABS FROM COSTA RICA.

BY MARY J. RATHBUN.

By permission of the Secretary of the Smithsonian Institution.

Prof. J. Fid. Tristan and Prof. P. Biolley of San José are making a study of the fauna of the mangroves of Costa Rica, and have submitted the crabs to me for examination. Three new species have been discovered, the types of which have generously been given to the U. S. National Museum.

Sesarma (Sesarma) rhizophoræ sp. nov.

Type.—Male, in alcohol. Boca del Jesus Maria, in the mud of mangroves, January, 1906. J. Fid. Tristan and P. Biolley, collectors. Cat. No. 32,491, U. S. National Museum.

Characters.—Carapace $\frac{4}{5}$ as long as wide, short-pubescent, smooth, punctate, very convex longitudinally, less so transversely. Front more than $\frac{1}{2}$ width of carapace, steeply inclined, sides parallel, lower edge sinuous in top view, convex in front view, superior lobes smooth, low, outer pair narrower than inner pair. Orbital margin directed strongly backward and outward, with a curved tooth at outer angle, behind which on the lateral margin there is a second strong tooth separated from the first by a deep sinus.

Arm and wrist crossed by short granulated rugæ; palms coarsely punctate, upper margin a single line of granules, inner surface partly granulous, some oblique lines near the top; dactylus punctate at base and with a granulate line above on the basal half. Legs pubescent, with some longer hairs, third pair about $2\frac{1}{4}$ times as long as carapace; merus joints armed with a slender subterminal spine; dactyli having a long slender tip; merus of third pair about $2\frac{1}{2}$ times as long as wide.

Abdomen of ♂ narrow except at its base; appendages of first segment ending in long needle-like points.

Measurements.—Length, 10.9; anterior width, 13; width at lateral tooth, 13.7; posterior width, 12.8; width of front, 7.5 mm.

Remarks.—This is the representative on the Pacific coast of *S. curacaoense* de Man*, in which, however, the legs are much shorter and broader, meral spines shorter and stouter, abdomen of ♂ broader, appendages of first segment stouter and devoid of slender tips.

* Notes Leyden Mus., XIV, p. 257, pl. X, fig. 6, 1892.

Sesarma (Holometopus) biolleyi sp. nov.

Type.—Male, in alcohol. Salinas de Caldera, Boca del Jesus Maria, January, 1906. J. Fid. Tristan and P. Biolley, collectors. Cat. No. 32,490, U. S. National Museum.

Characters.—Carapace a little broader than long, and broader behind than before, very uneven, granulate anteriorly, punctate and wrinkled posteriorly, nearly naked. Front ½ width of carapace, vertical, widening below, lower edge projecting, convex in front view. Superior lobes well marked, the middle pair wider. Upper margin of orbit sinuous, very oblique, outer tooth acuminate.

Chelipeds rugose, the ruge changing to single granules or tubercles on the distal half of the palms; the latter much inflated, inner face sparingly granulous, a transverse row of granules near the distal end. Dactyli very broad at base viewed from above and granulous. Legs long and narrow, third pair 2½ times as long as carapace, its merus 3 times as long as wide.

Measurements.—Length, 19.1; anterior width, 20.2; posterior width, 21; width of front above, 11.3 mm.

Remarks.—Allied to *S.* (*H.*) *miersii* Rathbun,* but differs in its carapace narrower anteriorly, upper border of orbit inclined more strongly backward, front wider, and ambulatory legs much longer and narrower. Occurred in abundance at the type locality.

Eurytium tristani sp. nov.

Type.—Male, in alcohol. Boca del Jesus Maria, hidden in the fine mud of rotten trees. J. Fid. Tristan and P. Biolley, collectors. Cat. No. 32,366, U. S. National Museum.

Characters.—Carapace slightly convex from side to side, strongly convex from front to back. Gastric region with its subdivisions and cardiac region well delimited. Surface finely granulate, without transverse striæ. Front ¼ as wide as carapace, bilobed, each lobe convex except for an inconspicuous outer tooth. Two distinct notches in the upper border of the orbit; tooth at outer angle blunt, prominent, and partly fused with the next or second lateral tooth which is nearly as advanced as the first and slightly larger; third, fourth and fifth teeth prominent, with convex outer margins; anterior border of third tooth straight and transverse, of fourth and fifth teeth concave and directed outward and backward. Lower teeth of orbit strongly projecting. Merus of outer maxilliped not dilated at outer angle. Chelipeds and legs as in *E. limosum* (Say).†

Measurements.—Length, 18; width, 28.2 mm.

Color.—Traces of violet on upper surface of chelipeds and of red on upper surface of movable finger.

Remarks.—This species resembles *E. limosum* in its convexity but differs in the cut of the front and antero-lateral teeth; *E. affine* (Streets and Kingsley)‡ is a much flatter species with inconspicuous side teeth.

* Proc. Biol. Soc. Wash., XI, p. 91, 1897.

† Jour. Acad. Nat. Sci. Phila., I, p. 446, 1817.

‡ Bull. Essex Inst., IX, p. 106, 1877.

Vol. XIX, pp. 101-112 July 30, 1906

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON BIRDS FROM COSTA RICA AND CHIRIQUI, WITH DESCRIPTIONS OF NEW FORMS AND NEW RECORDS FOR COSTA RICA.

BY OUTRAM BANGS.

In the spring of 1905 while Mr. Robert Ridgway was in Costa Rica, Mr. C. F. Underwood offered him for sale his entire collection of birds. Mr. Ridgway at once wrote to John E. Thayer, Esq., and myself, setting forth the great advantage it would be to American ornithologists to have this collection come to the United States. Mr. Thayer at once bought the collection and in due time it was packed and shipped to us. It consisted of 3,365 skins, representing about 611 species and subspecies—mostly from Costa Rica, though a few came from Guatemala. The collection had been kept by Underwood as a sort of type series from which he might name specimens he secured, and many of the skins had been identified by Salvin, the labels bearing names and notes in his handwriting. Besides containing representatives of most of the rarer Costa Rican species the collection is rich in young birds in nestling plumage, and where the series of a species is large, specimens both in freshly moulted plumage and in worn, abraded condition can be found. The dates on the labels cover nearly a score of years, and the collection is the result of Underwood's laying aside the better things secured by him during this period. Such a collection is invaluable.

Mr. Thayer turned the whole lot over to me for identification, and with help here and there from Ridgway, Nelson, Oberholser, Richmond, and Riley, I have at last finished the work, which, as usual, took a much longer time than I anticipated. At first Mr. Thayer was undecided what to do with the collection, but, noticing from time to time the great interest I took in it, finally,

with his accustomed generosity, told me to keep a series for my own collection and to arrange the duplicates for exchange—probably with the National Museum.

As was to be expected there proved to be several new forms and several new records for Costa Rica in the Underwood collection, besides which the fine material from the neighboring country gave me an opportunity for comparison of Chiriqui birds—collected by Brown—that I never before had had, resulting in the discovery among them of one or two new forms.

The following notes and descriptions are the results of my work on the Underwood collection, which also meant going over again all of Brown's Chiriqui collections.

Botaurus lentiginosus (Mont.).

One ♀ taken at Reventazon, November 5, 1899, appears to be the first Costa Rican record for the species.

Ereunetes pusillus (Linn.).

One ♀ from vicinity of San José, September 15, 1898, adds this species to the Costa Rican ornis.

Heteropygia bairdi (Coues).

Baird's sandpiper must also be given a place in the Costa Rican ornis, on the strength of one ♀ taken by Underwood at Cerro de la Candelaria, near Escazú in October, 1900.

Leptotila cassini vinaceiventris (Ridg.).

In the Underwood collection are two doves, both adult males, labeled *Leptotila cassini*, one of them so identified by Salvin, one from Volcan Miravalles, September 14, 1895, the other from Juan Vinas, March 20, 1902. The Miravalles specimen is typical *vinaceiventris*, exactly matching Honduras examples. The Juan Vinas bird is not quite typical, approaching *cassini* in its grayer breast and slightly darker and more lustrous upper parts. Compared, however, with a pretty extensive series it seems rather nearer to *vinaceiventris* than to *cassini*.

Geotrygon costaricensis Lawr.

In 1902* I recorded *Geotrygon costaricensis* from the Volcan de Chiriqui, on the strength of four adults taken there by W. W. Brown, Jr.

I was somewhat surprised a little later to see my record discredited in Biologia Centrali-Americana,† where my Chiriqui specimens are referred to *G. lawrencei* Salvin, and this done without seeing my skins or even writing

*Proc. New. Eng. Zoöl. Club, Vol. III, p. 24, Jan. 30, 1902.

†Vol. 3, p. 266, 1897–1904.

to me to ask if I had made a mistake! My identification was correct, and the birds from the Volcan de Chiriqui are true *G. costaricensis*, differing in no wise from Costa Rican specimens.

The Underwood collection contains a splendid series of *Geotrygon* which includes all the species known from Costa Rica—*Geotrygon albiventer*, *G. montana*, *G. veraguensis*, *G. lawrencei*, *G. costaricensis* and *G. chiriquensis*. I think it would be difficult to select more inapplicable names than *veraguensis*, *costaricensis* and *chiriquensis*, which three of these doves are doomed to bear, misleading any one not familiar with the birds to suppose they were local forms, confined each to the country the name of which it bears.

Pyrrhura hoffmanni gaudens subsp. nov.

Type from Boquete, Chiriqui. ♂ adult, No. 9117, coll. of E. A. and O. Bangs. Collected March 3, 1901, by W. W. Brown, Jr.

Characters.—Similar to true *P. hoffmanni* of Costa Rica, except in having the feathers of top of head—especially the occiput—more or less tipped with red and with red shafts; underparts slightly darker green—less yellowish green.

MEASUREMENTS.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Culmen.
9117	♂ad.	Chiriqui, Boquete	133	112	13.5	19
9116	♂ad.	do.	132	110.5	13.5	19.5
9115	♀ad.	do.	132	111.5	14	20
9125	♀ad.	do.	130	111	13	19

In Catalogue of Birds in British Museum, XX, p. 230, Salvadori noticed this difference between Costa Rican and Veraguan specimens of *P. hoffmanni*. When I compared Brown's Chiriqui birds, twenty-seven in number, with the Costa Rican material in the U. S. National Museum I was of opinion that it was not a constant difference, as there was in that institution one Costa Rican skin with some red tips to the feathers of the nape, and I had one skin from Chiriqui that had none of the usual red tipping. I find on closer inspection that this latter bird is young—not full grown—and even the yellow markings of the head are ill defined. All the skins in the Underwood collection are without a trace of these red-tipped feathers, and the one Costa Rican specimen, before referred to, is the only one to show anything of the sort. It has the red-tipped feathers and red shafts developed about as much as in Chiriqui skins that show such markings the least. Chiriqui skins usually, also, have more yellow on the crown than Costa Rican ones, and slight as the differences are it seems best to recognize two subspecies. I for one do not hold that subspecific characters must be absolutely constant. In this very case I do not think that one Costa Rican specimen, out of the large number examined, showing the characters of the southern form, should be considered to disprove the existence of such a form.

The two subspecies of *Pyrrhura hoffmanni* are easily recognized by the Costa Rican true *hoffmanni* being without red tips and shafts to the feathers of nape and crown (one skin only out of a large number examined showing any) and the Chiriqui form, *gaudens*, having always, when adult, such red markings, often very conspicuously developed.

Eumomota superciliaris australis subsp. nov.

Type from Bebedero, Costa Rica. ♂ adult, No. 16,499, coll. of E. A. and O. Bangs. Collected February 11, 1899, by C. F. Underwood.

Characters.—Similar to true *E. superciliaris*, but paler in color throughout, blue color of wings and tail much paler, more greenish blue; superciliaries chiefly whitish or very pale blue; cinnamon-rufous of middle of back and belly paler, particularly so on belly; and wings quite different in character, the primaries much shorter in proportion to secondaries, so that the secondaries reach nearly to the wing tip; black tips of tertials and secondaries much shorter.

MEASUREMENTS.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Exposed Culmen.
16,499	♂ ad.	Bebedero, C. R.	109	200	21	41
16,500	♀ ad.	do.	107	181	20	...

The Underwood collection contained but two skins of this bird,—which is I believe rare and local in Costa Rica,—both from Bebedero, the type, an adult male taken February 11, 1890, and an adult female, September 11, 1893. These two are alike in all important points, and differ very much from any northern specimen—I have examined a score or more—in the very peculiar wing with the secondaries and tertials reaching almost to the wing tip, instead of falling far back of it. The short black ends of the tertials and secondaries and the generally paler and duller coloring of the southern bird are also striking characters, and if other Costa Rican examples prove like my two I believe this southern extreme will be found to be more than subspecifically different from the northern true *E. superciliaris* (Sandbach).

Cryptleus apiaster Lesson, Rev. Zool. 1842, p. 174, was described from "San Carlos Americæ Centralis, Oceani Pacifici." As every Central American State except British Honduras has a town in it called San Carlos, I am at a loss to tell just whence Lesson's type came. There is nothing in the description to indicate that the bird differed in any way from true *Eumomota superciliaris*, and I am forced to regard Lesson's name as a synonym of the northern form.

Saucerottea cyanura impatiens subsp. nov.

Type (and only specimen) from San Pedro, Costa Rica, *fully* adult ♂, No. 16,684, coll. of E. A. and O. Bangs. Collected October, 1904, by C. F. Underwood.

Characters.—Similar to true *S. cyanura* (Gould), but larger with shorter bill; head, back and breast darker green; under tail coverts dull steel blue edged with rich ferruginous—the under tail coverts in true *S. cyanura* are edged with pale grayish.

Measurements.—Type, old adult ♂: Wing, 54; tail, 28; culmen, 18.

Compared with *S. sophiæ* (Bourc. & Muls.), the common Costa Rican species, the new bird is at once distinguished by its more glittering green crown, rusty instead of grayish edges to under tail coverts and wholly different wing with conspicuous chestnut patches in it, and lined with chestnut.

The type locality of *Saucerottea cyanura* (Gould) is Realejo, Nicaragua, near the Pacific coast in the northwestern part of the republic. I have seen no specimens from this immediate region, but have compared the one Costa Rican skin with three from the boundary line between Honduras and Nicaragua, 180 miles from Pacific coast, and one from Guatemala. Gould's figure and description of the type agree minutely with these four skins, and not at all with the type of my new form from Costa Rica.

Apparently *S. cyanura impatiens* is an extremely rare bird, the type being the only individual Underwood ever saw; but it must be borne in mind that the ornis of much of Costa Rica remains still unknown. Many tropical American birds are exceedingly local, though perhaps common in certain spots, and this hummer may yet be found in numbers somewhere.

Oreopyra.

Salvin in Cat. of Birds in British Museum and Hartert in Trochilidæ, both allow four forms to the genus of humming-birds, *Oreopyra*, confined to Costa Rica, Chiriqui and Veragua. Salvin gives these all specific rank while Hartert allows two species and two subspecies.

With the specimens in the Underwood collection and those taken by W. W. Brown, Jr., on the Volcan de Chiriqui combined, I have before me a series of upwards of 200 skins, representing three of the four recognized forms. A critical study of this large amount of material has induced me to alter somewhat the arrangement of the species and subspecies as adopted by Hartert, which was as follows—

1*a*. *Oreopyra leucaspis leucaspis* Gould. Chiriqui.
1*b*. *O. leucaspis cinereicauda* Lawr. Costa Rica.
2*a*. *O. calolæma calolæma* Salv. Costa Rica and western Panama.
2*b*. *O. calolæma pectoralis* Salv. Costa Rica.

The females of all are practically alike (I can tell none of them). *O. leucaspis* and *O. calolæma* are distinguished by the male of the former having a white and the male of the latter a violet throat. *O. cinereicauda*, however, is quite distinct in that the male has a gray tail (the others having it steel blue) and a much bluer, less greenish crown. *O. pectoralis*—a form I have not seen—I should judge to have been based on abnormal specimens

of *O. calolæma calolæma* faded or discolored by some change in the feathers, as it is said to differ only in its breast being darker, and when viewed from in front nearly black. Especially as Hartert says it occurs with true *O. calolæma* in several parts of Costa Rica. At all events, Underwood did not have a specimen in his collection, and it is with the other three forms that I have to deal.

The first point to be decided is whether or not the white throat of *leucaspis* as against the violet throat of *calolæma* is a specific or subspecific character, or even a character at all, and I must confess that even the large amount of material I have examined does not satisfy me on this point. The series taken on the Volcan de Chiriqui by Brown contained but one individual with a violet throat; all the others have the throat *mostly* white; close inspection, however, shows that there are some violet-tipped feathers at the edge of the white patch in nearly every one of these white-throated birds. Among the Costa Rican skins of *O. calolæma* I find none but violet-throated birds. These are mostly from Irazú and Cerro de la Candelaria. *O. cinereicauda*, that occurs chiefly (if not exclusively) in the Dota Mountains in central Costa Rica, between the Volcan de Chiriqui and Irazú and the Cerro de la Candelaria, has the throat usually mixed violet and white; out of 63 males, 33 have the throat violet and white mixed, in some nearly half and half, and 30 have plain white throats. Otherwise *cinereicauda* is not in the least intermediate between *calolæma* and *leucaspis*, but differs widely from both in its gray tail and bluer crown.

Examining the feathers of the throat carefully, we find them in the white-throated specimens to be gray at base then pure white to ends, in both *leucaspis* and *cinereicauda*. In the one violet-throated bird from the Volcan de Chiriqui, the feathers are gray at base, then white in middle and merely tipped with violet. In *calolæma* from Costa Rica the gray bases of the feathers extend upwards to the violet tips and there is no white middle part to the feathers of the throat. I therefore think that the violet-throated birds (either with the throat wholly or partially violet) from Chiriqui are merely cases of extreme individual variation of *O. leucaspis*.

White-throated examples with steel blue tails, *i. e.*, *O. leucaspis*, are only known from the Volcan de Chiriqui, and even here some examples have the throat violet. As I have said before, however, *all* Costa Rican skins have the throat violet.

I have seen no specimens from the Veraguan Ranges. Salvin, however, records violet-throated birds from the western ranges — Cordillera del Chucu, Cordillera de Tolé, etc.—which he calls, together with the violet-throated ones from Volcan de Chiriqui, *O. calolæma*. I am unable to say if these have white below the violet, or if they are like Costa Rican specimens and have the gray of the bases of the feathers extended upward and meeting the violet tips; probably they are *calolæma*. In my opinion *O. calolæma* and *O. leucaspis* are exceedingly closely related forms, differing in extreme cases in one having a violet and the other a white throat, but in many instances only to be told apart by one having white below the violet tips of the feathers of the throat and the other gray, and I should treat them only as subspecies at the best.

O. cinereicauda seems to be a perfectly distinct species. *Trochilus castaneoventris* Gould is, furthermore, the name by which the bird of the Volcan de Chiriqui, which I have called throughout this article, for the sake of clearness, *O. leucuspis*, must be known. It was based on a female bird from the Cordillera of Chiriqui, and is the earliest name for any member of the genus. I should therefore arrange the forms as follows:

Orcopyra castaneoventris castaneoventris (Gould.) Volcan de Chiriqui.
O. castaneoventris calolæma (Salv.) Costa Rica; Irazú, Cerro de la Candelaria, Dota Mts. (one skin in Underwood coll.), etc. South to western ranges of Veragua.
(*O. pectoralis* Salv. A doubtfully valid form, occurring with *O. c. calolæma* in several parts of Costa Rica, the alleged differences probably being due to fading or to some aberrant difference in structure of the feathers.)
O. cinereicauda, Lawr. Central Costa Rica. Dota Mts.

Melanerpes wagleri Salv. & Godm.

In the Underwood collection is one young male of this species, taken at Pozo Azul, July 9, 1903. This is I believe the first time the bird has been recorded from Costa Rica, where the place of this Panaman form is taken by *Melanerpes hoffmanni*.

Hypocnemis nævioides capnitis subsp. nov.

Type from Volcan Miravalles, Costa Rica. ♂ adult. No. 17,048, coll. of E. A. and O. Bangs. Collected October 16, 1895, by C. F. Underwood.

Characters.—Similar to *H. nævioides** (from Panama) except that the adult ♂ has the whole sides and flanks slate color. (In true *H. nævioides* (Lafr.) the sides are whitish tinged with pale gray, and flanks pale grayish brown).

The adult ♀ of the new form has the sides and flanks darker, duller brown, and the back deeper chestnut, than in true *H. nævioides*.

MEASUREMENTS.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Exposed Culmen.
17,048	♂ ad.	Miravalles, C. R. . . .	61	31	24	17
17,047	♀ ad.	Carrillo, C. R.	59	32	22	17

Mr. W. W. Brown, Jr., took examples of true *H. nævioides* (Lafr.) at Loma del Leon, and near Panama City, Panama, but did not meet with the species anywhere in Chiriqui, and so far as I am aware *H. nævioides* has never been recorded from Veragua or Chiriqui, there being, apparently, a gap between the ranges of the Costa Rican and Panaman forms.

* Type locality, Pasto, southwestern Colombia.

Xenicopsis variegaticeps idoneus subsp. nov.

Type from Boquete, Chiriqui. Adult ♂. No. 8943, coll. of E. A. and O. Bangs. Collected March 4, 1901, by W. W. Brown, Jr.

Characters.—Similar in size and proportions to true *Xenicopsis variegaticeps* Scl. of Costa Rica to southern Mexico (type locality, southern Mexico), but strikingly different in the color of underparts, which in the new form are dull yellowish olive, and in true *X. variegaticeps* rich reddish brown. The back and rump in *X. variegaticeps idoneus* are paler and more olivaceous, less reddish brown than in true *X. variegaticeps*.

From *X. temporalis* (Scl.) of Ecuador, the Chiriqui bird differs in having the shaft spots on breast and belly much less well developed.

MEASUREMENTS.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Exposed Culmen.
8943	♂ ad.	Boquete, Chiriqui	86	69	20.4	18.2
8944	♀ ad.	do.	79	67.5	20	18

In 1890 Dr. Sclater called attention to the differences in color between northern and southern examples of *Anabazenops variegaticeps*, in Catalogue of Birds, Vol. XV, pp. 106–107, but so far as I am aware the species has not been subdivided by name till now.

The eight specimens collected by Brown on the Volcan de Chiriqui from 4,000 to 4,800 feet altitude vary but little one from the other and are all very different in color from northern examples. The range of the new form does not extend north of Chiriqui, Costa Rican examples being wholly referable to true *X. variegaticeps*.

X. variegaticeps idoneus is an intermediate form, between true *X. variegaticeps* and *X. temporalis*, though different enough from either to be recognized by name.

Thryorchilus ridgwayi sp. nov.

Type from Volcan Irazú, Costa Rica. Adult (♂?).* No. 17,152, coll. of E. A. and O. Bangs. Collected March 4, 1899, by C. F. Underwood.

Characters.—Similar to *Thryorchilus browni* (Bangs) of the Volcan de Chiriqui but slightly larger and color of upper parts and flanks darker and decidedly more olivaceous, less reddish brown—almost bistre on head, back, flanks, under tail coverts and anal region, gradually shading into mummy brown on rump and upper tail coverts.

MEASUREMENTS.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Exposed Culmen.
17,152	(?♂) ad.	Volcan de Irazú, C. R. . .	52	32.5	23.5	14
199,509	†♂ ad.	do. . .	50	30.5	23	13.2

When Mr. Ridgway packed up for shipment the Underwood collection he discovered among the wrens it contained one skin belonging to this

*The type was not sexed by the collector but undoubtedly is a male.

†Coll. U. S. National Museum.

little known genus from Irazú, and wrote me that he thought it represented a new form.

Later in the season—May, 1905—Mr. Ridgway visited Irazú himself and had the pleasure of seeing the species in life, his companion, Don Anastasio Alfaro, succeeding in taking one example, which has been kindly lent me.* The species lived on Irazú in brushwood in ravines above timber-line. There is no cane (bamboo) on Irazú. It was not uncommon, though very hard to shoot.

The Irazú wren is quite distinct from the only other known member of the genus, *T. brouni* of the Volcan de Chiriqui, wholly lacking the strong ruddy or chestnut coloring of the lower back, rump, tail coverts and flanks of that species ; it is also larger.

Cyanolyca blandita sp. nov.

Type from Volcan de Chiriqui, 9,000 feet altitude, ♂ adult. No. 9324, coll. of E. A. and O. Bangs. Collected June 2, 1901, by W. W. Brown, Jr.

Characters.—Similar to *Cyanolyca argentigula* (Lawr.) of Costa Rica and of the same size, but throat constantly pale blue—flax flower blue — and pale colored band across head narrower and blue throughout, darker on sides of head, paler in middle. In *C. argentigula* the throat is silvery white, sometimes shaded with lavender gray; the band across head is much wider, nearly white in middle and pale blue at the sides.

Nestlings of the two forms are easily distinguished; even in this stage of plumage *C. argentigula* having a silvery and *C. blandita* a blue throat. The band across the head is narrower and less definite than in the adults, but it is bluish in *C. blandita* and whitish in *C. argentigula*.

MEASUREMENTS.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Exposed Culmen.
9324	♂ ad.	Volcan de Chiriqui.	74	132	35.5	26
9327	♀ ad.	do	71	131.5	34.5	26

At the time I worked over the collections made in Chiriqui by Brown I did not have adequate material from Costa Rica and referred the Chiriqui bird to *C. argentigula*. The splendid series in the Underwood collection including adults taken at various seasons of year (January, February, May, June, and September), and nestlings, compared with the equally good one from Chiriqui, at once proved the incorrectness of my earlier identification, and showed the forms from the two regions to be distinguishable at a glance.

Vireolanius pulchellus viridiceps Ridg.

In the Underwood collection is one fine adult male of this subspecies from Pozo Azul, western Costa Rica, taken June 10, 1903. Thus still an-

*See Robert Ridgway, A Winter with the Birds of Costa Rica, The Condor, Vol. VII, No. 6, November-December, 1905, p. 159.

other Panaman form proves to extend its range north to the Pacific slope of Costa Rica. Apparently the more northern subspecies *V. pulchellus verticalis* Ridg. occupies eastern Costa Rica and extends southward even to the Volcan de Chiriqui. I have one adult bird (the only one from the region in my collection) from Boquete, Chiriqui, that is absolutely typical *V. pulchellus verticalis*. The characters that separate these two forms appear perfectly good, and we have in these vireos another instance of a Panaman form extending into western and a Central American form into eastern Costa Rica.

Stelgidopteryx.

In the Underwood collection is an extremely interesting series of nine rough-winged swallows, no two of which are quite alike. One or two breeding birds from Pozo Azul and Juan Vinas, C. R., and two others in fresh plumage taken in March, are rather nearer *serripennis* than any of the other subspecies, and might almost pass for that form except that all show some fulvous on the throat and one or two have dusky spots, more or less well developed, on some of the longer under tail coverts; another skin, a breeding bird, taken at Pozo Azul, June 16, is exactly intermediate between these and *uropygialis;* three others from Pozo Azul and Carrillo I should call *uropygialis*.

I must again emphatically express my belief that there is *but one* species of *Stelgidopteryx*. Since I first made this statement (Proc. New Eng. Zoöl. Club. Vol. II, pp. 57–60, July 31, 1901), I have been accumulating what specimens I could, and now have a much more extensive series, that to my mind conclusively proves this. Selecting specimens of breeding birds from a large amount of material I can lay out a line of skins that shows every possible stage of intergradation between the various forms and every combination of characters. There is no reason for considering any of the forms more than subspecies, there is absolutely no break in the chain anywhere, and no gap in the breeding range of the species.

The form Ridgway named *S. salvini* was based on a series of intergrades between *serripennis* and *uropygialis*, very unstable in character, and subject to an immense amount of variation. This is the bird I called *fulvipennis*, a name which I still do not feel at all sure is not the proper one, if such intergrades are to be recognized by name at all.

S. ridgwayi Nelson unquestionably intergrades with *serripennis*. I have an adult male taken March 6, at Texolo, V. C., Mex., that is exactly intermediate in every character. I occasionally, also, find well developed dusky markings on under tail coverts in specimens taken within the United States, one adult male taken April 4, at Barrington, Ga., having these markings very conspicuously developed.

I was pleased to see that Dr. Hellmayr, in a recent paper on the birds of Trinidad, agrees with me and also recognizes the very pale form of the northeastern portion of South America that I named *S. ruficollis æqualis*, especially as other students of the American ornis have persisted in taking the opposite view.

Chlorophanes spiza (Linn.).

The twenty-six skins of *Chlorophanes spiza* in the Underwood collection from Pozo Azul and San José are intermediate between subspecies *guatemalensis* and *exsul* though rather nearer the latter. None of them have as long bills as the northern form and none are quite so large, and although none have quite the small size and short bill of *exsul*, several specimens might well pass for that form.

Dacnis cayana callaina Bangs.

The Underwood collection contains nine skins of this form, three of them fully adult males, all from Pozo Azul, thus extending the range of the Chiriqui form to western Costa Rica. Unfortunately there were no skins from other places in Costa Rica, but I fancy *ultramarina* is the subspecies that inhabits the eastern part of the country.

Icterus prosthemeles Strick.

There is in the southern part of the range of *Icterus prosthemeles* a tendency toward a curious phase of plumage that apparently never occurs among birds from Mexico or Guatemala. In a series of southern specimens some can always be found that show much black mottling on flanks and have the black of breast extended far backward over the belly, and in a few specimens the black of the back also encroaches much on the yellow rump patch. If all southern examples were alike, no ornithologist would hesitate to recognize a southern form by name, but they are not. In fact the larger number of specimens from Panama to Honduras are quite like Mexican examples. It may be that in time this tendency among southern examples to show much more black than northern ones will become a fixed character, but at present it certainly is not.

In the Underwood collection there were but two skins of this species, one the blackest I have ever seen, the other exactly like ordinary Mexican specimens.

Icterus sclateri Cassin.

In Birds of North and Middle America, part II, pp. 297–298, foot-note, Ridgway suggests that perhaps two forms of this striking oriole may really exist,—*Icterus sclateri sclateri* Cassin, Nicaragua to Costa Rica, and *I. sclateri formosus* (Lawr.), Honduras to Oaxaca.

In the Underwood collection there is a fine pair from Miravalles, Costa Rica. These and my one Mexican example, Nelson compared for me with all the material in Washington, and found no appreciable difference in size between northern and southern specimens. Southern skins have the back more solidly black than northern, but the difference is slight and perhaps partly due to season—the southern specimens examined being in freshly acquired autumnal plumage, and there seems no need for a subdivision of the species.

Chlorospingus regionalis sp. nov.

Type from Cariblanco de Sarapiqui, Costa Rica. ♂ adult. No. 17,491, coll. of E. A. and O. Bangs. Collected August 11, 1899, by C. F. Underwood.

Characters.—Similar to *Chlorospingus novicius* Bangs of Volcan de Chiriqui, but much duller in color, especially below, the rich greenish ochre of jugulum and olive yellow of breast and sides and under tail coverts of *C. novicius* being replaced in the new form by dull yellowish, olive-green—slightly brighter and more yellowish on jugulum and darker and duller on sides and under tail coverts; back duller and browner olive and size a little larger than in *C. novicius*.

MEASUREMENTS.

No.	Sex.	Locality.	Wing.	Tail.	Tarsus.	Exposed Culmen.
17,491	♂ ad.	Cariblanco de Sarapiqui, C. R.	70	57	22	...
17,492	♀ ad.	Azabar, C. R.	68.5	57	22	13

At the time I separated *C. novicius* from *C. albitemporal* (Lafr.) of South America, Ridgway and I together compared very carefully the Chiriqui series with such specimens from Costa Rica as were in the National Museum, and made up our minds that birds from the two regions were subspecifically distinct, as suggested by Ridgway—Birds of North and Middle America, Part II, p. 164, foot-note. The use here of a binomial for the form, is not because I consider it very different from *C. novicius*, but because both may eventually prove to be subspecies of *C. albitemporal*, and in such cases, until the real relationships of the forms are established, binomials are preferable to trinomials.

Junco vulcani (Boucard).

The Irazú Junco, the most southern and most aberrant member of the genus, is confined, so far as known, to the summits above timber line, of the Volcan de Chiriqui and of Irazú. One would naturally expect to find a bird of such peculiar habits and habitat differentiated into at least subspecies on these two isolated peaks. I have before me now a beautiful suite of specimens, which includes adults and young taken on corresponding dates from both Irazú and the Volcan de Chiriqui, and while there is a slight difference in birds from the two volcanoes I am unable satisfactorily to separate them. Birds from Irazú are a little darker, with slightly grayer heads and with backs more heavily marked with black than in those from the Volcan de Chiriqui, but the differences are trifling and not altogether constant, and after very careful consideration I have decided it would be unwise to divide the species into two subspecies.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SCYLLARIDES FROM BRAZIL.

BY MARY J. RATHBUN.

By permission of the Secretary of the Smithsonian Institution.

The specimen here described was among those taken by the U. S. Fish Commission steamer *Albatross* during her voyage around the Horn in 1887–88.

Scyllarides brasiliensis sp. nov.

Type.—Female, in alcohol. Bahia, Brazil. U. S. Fish Commission steamer *Albatross*, December 21, 1887. Cat. No. 21,612, U. S. National Museum.

Characters.—Very hairy. Carapace varying little in width. Orbits near the anterior corners; distance from orbit to side margin $\frac{2}{5}$ of distance from orbit to middle of carapace; transverse diameter of orbit much less than longitudinal diameter. Inner margins of first three movable joints of antennæ dentate, teeth flattened, not erect; antepenult segment without prominent teeth at the angles.

First segment of abdomen with two circular and distant red spots, the interspace greater than the distance from either spot to the outer margin of the segment. Second to fifth segments medially carinate.

Crests on the meropodites of the legs becoming successively less prominent from the first to the fifth pair; the same is true of their terminal teeth. Very slight crests on the carpopodites; propodites rounded above. Legs of third to fifth pairs rather long and narrow.

Measurements.—Length of carapace, 86.5; greatest width, 80.5 mm.

Remarks.—Allied to *S. æquinoctialis* (Lund).*

* Skrivt. Naturh.—Selsk., Copenhagen, II, pt. 2, p. 21, 1793.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF SOME NEW FORMS OF OLIGOMYODIAN BIRDS.

BY ROBERT RIDGWAY.

By permission of the Acting Secretary of the Smithsonian Institution.

Coryphotriccus gen. nov. (*Tyrannidæ*).

Type, *Pitangus albovitattus* Lawrence.

Similar to *Pitangus* but bill relatively much shorter and broader (exposed culmen little if any longer than tarsus and much less than twice the width of bill at frontal antiæ), and rictal bristles much weaker; still more closely related to *Conopias*, but exposed culmen equal to or slightly longer than tarsus, instead of much shorter.

(Κορυφή, the crown; τρίκκος, a small bird.)

Todirostrum cinereum coloreum subsp. nov.

Type, No. 33,350, Am. Mus. Nat. Hist., adult male, Corumbá, Mattogrosso, southwestern Brazil, March 17, 1886; H. H. Smith.

Similar to *T. cinereum cinereum* (Linnæus) but larger, back more extensively and clearly olive-green (the hindneck sometimes olive-green), white tips to rectrices more extensive, yellow of under parts brighter, and yellow margins to greater wing-coverts and inner secondaries paler.

Southwestern Brazil (Province of Mattogrosso.)

Atalotriccus pilaris venezuelensis subsp. nov.

Type, No. 73,454, adult male, Am. Mus. Nat. Hist.; San Antonio, Bermudez, Venezuela, July 15, 1896; W. H. Phelps.

Similar to *A. pilaris pilaris* but larger and coloration darker, with pileum decidedly darker and duller in color than back.

Venezuela.

Rhynchocyclus klagesi sp. nov.

Type, No. 75,587, Am. Mus. Nat. Hist., adult female, Maripa, Venezuela, May 9, 1901; S. M. Klages.

Similar to *R. sulphurescens* (Spix) but much smaller and coloration slightly darker; wing, 52; tail, 44; exposed culmen, 11; tarsus, 15; middle toe, 8.

Venezuela (Maripa).

This bird may possibly be the same as *R. assimilis* Pelzeln (Orn. Bras., ii Abth., 1869, 181), from Engenho de Gama, San Vicente, Borba, Rio Negro, and Barra, northern Brazil, but without a specimen of the latter for comparison it is impossible to be sure whether the two are identical or not.

Mionectes olivaceus venezuelensis subsp. nov.

Type, No. 70,345, Am. Mus. Nat. Hist., adult female, Guacharo, Venezuela, December 14, 1898; F. W. Urich.

Similar to *M. olivaceus olivaceus*, of Costa Rica and Panama, but larger (adult female averaging wing 67.8, tail 52.5, exposed culmen 13.5, instead of 63.3, 45.9, and 12.5 respectively), and throat more broadly and more distinctly streaked.

Venezuela.

Elænia frantzii stolzmanni subsp. nov.

Type, No. 88,441, U. S. Nat. Mus., adult female, Tambillo, northern Peru, September 11, 1877; F. Stolzmann.

Similar to *E. frantzii frantzii* but upper parts browner and slightly darker and under parts much more strongly yellowish (abdomen and median portion of breast between straw yellow and sulphur yellow).

Northern Peru (Tambillo).

Although identified by Count von Berlepsch as *E. obscura* (Lafresnaye and D'Orbigny), the specimen mentioned above is very different from any of the several specimens of that species in the National Museum collection and is much nearer *E. frantzii*. It is very slightly larger than any female of the latter of the series measured in length of wing and tail, which are 81 and 72.5, respectively, the maximum of *E. frantzii* (thirteen females) being 80.5 and 71.

Myiarchus ferox actiosus subsp. nov.

Type, No. 198,632, U. S. Nat. Mus., adult male; Pigres, at mouth of Gulf of Nicoya, Costa Rica, March 6, 1905; R. Ridgway.

Similar to *M. ferox panamensis* (Lawrence) but color of back, etc., darker and duller olive, hindneck, sides of neck, and sides of head purer gray, and yellow of under parts paler; still more like *M. f. phæocephalus* (Sclater), of western Ecuador, and scarcely to be distinguished except for paler yellow of under parts.

Pacific coast of Costa Rica.

Megarynchus pitangua caniceps subsp. nov.

Type, No. 126,595, U. S. Nat. Mus., male ad., Barranca Veltran, southern Jalisco, March 25, 1892; P. L. Jouy.

Similar to *M. pitangua mexicanus* but pileum sooty gray or deep mouse gray instead of blackish, and color of back, etc., much grayer olive.

Western Mexico.

Pipra erythrocephala berlepschi subsp. nov.

Type, No. 147,568, U. S. Nat. Mus., Nauta, northeastern Peru, Dec. 8 1883; T. Hauxwell.

Similar to *P. erythrocephala erythrocephala* but yellow of head and neck much lighter (bright chrome instead of cadmium yellow or orange) and usually without any red posterior margin; wing averaging decidedly longer and bill slightly smaller. (Wing of adult male averaging 59.6; exposed culmen, 8.9.)*

Eastern Ecuador to central Colombia (Bogota), northeastern Peru, and lower Amazon Valley.

Count von Berlepsch has long ago called attention to the differences presented by birds of this species from eastern Ecuador on the one hand and those from northeastern Colombia (Bucaramanga) and Venezuela on the other (Journ. für Orn., 1884, 304, 305). I find the differences mentioned by him entirely constant in a series of nine adult males from the Rio Napo, eastern Ecuador, and two from Nauta, northeastern Peru, as compared with ten adult males from Cayenne and British Guiana, ten from Venezuela, nine from Trinidad, and six from northern Colombia. Specimens from Bogota, central Colombia, are, as might be expected from geographical considerations, intermediate, but are decidedly nearer to the upper Amazon form. A single specimen from Pará, on the lower Amazon, agrees with *P. e. berlepschi* in coloration but is very small, the wing measuring only 52 mm. while the shortest wing in the series of eleven specimens from the upper Amazon measures 56.5, the longest 61.5 mm.

Pipra pipra bahiæ subsp. nov.

Type, No. 115,147, U. S. Nat. Mus., adult male, Bahia, s. e. Brazil; C. H. Townsend and T. Lee.

Similar to *P. pipra pipra* but adult male with under parts of body, posterior to chest, dull slate-black or blackish slate instead of intense blue-black, and black of other portions less intense and much less bluish or violaceous.

Southeastern Brazil.

Pipra pipra anthracina subsp. nov.

Type, No. 108,278, U. S. Nat. Mus., adult male, Moravia, Costa Rica, Oct. 30, 1885; Juan Cooper.

Similar to *P. pipra pipra*,† of Cayenne, British Guiana, and Venezuela, but wing decidely shorter, bill smaller, black color of adult male much less lustrous (deep velvet or opaque black instead of glossy blue-black), and under tail-coverts tipped with grayish.

Panama and southern Costa Rica.

* Eleven specimens. Thirty-five adult males of *P. e. erythrocephala* average: Wing, 57.9; exposed culmen, 9.5.

† [*Parus*] *pipra* Linnæus, Syst. Nat., ed. 10, i, 1758, 190. *Pipra leucocilla* Linnæus, Mus. Frid. Adolph. Regis., ii, 1764, 32; Syst. Nat., ed. 12, i, 1766, 340. [*Pipra*] *leucocapilla* Gmelin, Syst. Nat., i, pt. ii, 1788, 1002.

More closely resembling *P. p. coracina** in coloration, but the black decidedly less bluish and size much less.

Scotothorus olivaceus sp. nov.

Type, No. 75,520, Am. Mus. N. H., adult female, Rio Mato, Venezuela, Jan. 25, 1901; S. M. Klages.

Most nearly resembling *S. rosenbergi* (Hartert) of northern Ecuador, but much lighter in color throughout (above clear olive, the wings and tail sepia brown, beneath light olive, tinged with pale yellow, the throat tinged with buff), and with wing, tail, and tarsus decidedly longer (wing 88, tail 62, tarsus 22 mm.).

Venezuela.

Scotothorus furvus sp. nov.

Type, No. 62,070, U. S. Nat. Mus., adult male, Boquete de Chitra, Veragua, Panama, 1869; E. Árce.

Most like *S. rosenbergi*, but much darker and more uniform in color (decidedly the darkest member of the genus), the upper parts dark olive-brown or bister, under parts nearly uniform deep olive (more grayish on under tail-coverts), bill much larger and tail much longer; also somewhat resembling *S. wallacii* Sclater and Salvin, but very much darker throughout (especially on lower parts), bill much larger, and tail relatively longer (wing 89.5, tail 66.5, exposed culmen 16 mm.).

Pacific slope of western Panama.

Attila tephrocephala sp. nov.

Type, No. 64,624, U. S. Nat. Mus., adult female, Talamanca, Costa Rica; José C. Zeledon. (Collector's No. 442.)

Somewhat like the grayer or more olivaceous examples of *A. citreopyga citreopyga* but pileum brownish slate-gray or mouse gray, lower throat, chest and sides of breast uniform light mouse gray or olive-gray, throat with fewer and less distinct dusky streaks, and larger wing-coverts much less distinctly tipped with brown.

Southeastern Costa Rica (Talamanca).

Attila citropyga salvini subsp. nov.

Type, No. 177,358, U. S. Nat. Mus., adult male, Pasa Nueva, Vera Cruz, Mexico, March 23, 1901; A. E. Colburn.

Similar to *A. c. citreopyga*, of Nicaragua, Costa Rica, and Panama, but decidedly browner above (the pileum and hindneck never olivaceous), rump and upper tail-coverts ochraceous instead of light chrome, naples, or maize yellow, tail more cinnamomeous or tawny, and size averaging decidedly larger.

Southeastern Mexico to Honduras.

This is the form usually known by the name *Attila citreopygia* (Bonaparte); but the type of the latter came from Nicaragua, and therefore be-

* *Pipra coracina* Sclater, Proc. Zool. Soc. Lond., 1856, 29 (Bogotá, Colombia). *P*[*ipra*] *leucocilla coracina* Berlepsch and Hartert, Novit. Zool., ix, April, 1902, 53, in text.—*Pipra leucocilla coracina* Hellmayr, Ibis, 1906, 26 (monogr.).

longs to the southern form known as *A. sclateri* Lawrence, the latter name being a synonym of *A. citreopyga*.

Attila citreopyga luteola subsp. nov.

Type, No. 64,623, U. S. Nat. Mus., adult male, San José, Costa Rica; José C. Zeledon. (Collector's No. 247.)

Similar to *A. citreopyga cinnamomea*, of western Mexico, but decidedly smaller, rump and upper tail-coverts yellow instead of ochraceous, and anterior under parts much less distinctly streaked. Differing from *A. c. citreopyga* in much lighter and more cinnamomeous color of back, scapulars, and tail and much less distinctly streaked throat and chest.

Pacific slope of Costa Rica and Nicaragua.

Tityra semifasciata columbiana subsp. nov.

Type, No. 170,410, U. S. Nat. Mus., adult female, La Concepcion, Santa Marta, Colombia, April 6, 1899; W. W. Brown, Jr.

Similar to *T. semifasciata semifasciata* but adult male with forehead much less extensively black, and adult female much darker above, with back and scapulars light grayish brown (instead of brownish gray to pure gray) and pileum deep grayish brown (instead of light grayish brown or brownish gray).

Northern Colombia (Santa Marta district).

Tityra semifasciata costaricensis subsp. nov.

Type, No. 199,039, U. S. Nat. Mus., adult female, Bonilla, Costa Rica (Atlantic slope), March 29, 1905; Anastasio Alfaro.

Similar to *T. s. columbiana* (the adult male scarcely if at all distinguishable) but usually with black area on inner web of lateral rectrices more extensive; adult female much darker and browner, the back and scapulars deep grayish brown, pileum and auricular region darker grayish brown, and rump darker gray; slightly smaller (Panama specimens decidedly so).

Panama to southern Honduras (Rio Segovia).

Although Dr. Sclater and Messrs. Sclater and Salvin profess their inability to distinguish the birds of this species from Mexico and Central America from those of South America, and consequently unite them all under the name *Tityra semifasciata*, examination of a splendid series (several hundred specimens) shows clearly that in reality the species is easily divisible into several well-defined geographic forms, of which I am able to characterize the following:

1. *Tityra semifasciata semifasciata* (Spix). Southern Brazil, etc., to central Colombia (Bogota).

2. *Tityra semifasciata columbiana* Ridgway. Northern Colombia (Santa Marta district).

3. *Tityra semifasciata costaricensis* Ridgway. Panama to southern Honduras. (Panama specimens are intermediate in coloration between the typical bird from Costa Rica, Nicaragua, and southern Honduras on the one hand and Santa Marta examples (*T. s. columbiana*) on the other, but are decidedly smaller than the latter and on the whole nearer the former in coloration).

4. *Tityra semifasciata personata* (Jardine and Selby). Central Honduras to eastern Mexico. (This form is decidedly larger than either of the preceding, has the adult male decidedly deeper gray (especially on upper parts), the adult female most resembling that of *T. s. costaricensis* from Panama but with the general color of upper parts browner and color of pileum scarcely if at all darker than that of back.) Specimens from Yucatan are decidedly smaller and somewhat paler, the females averaging still more brown above and may require separation.

5. *Tityra semifasciata griseiceps* (Ridgway). Western Mexico. (Adult males of this form are scarcely if at all different in coloration from those of *T. s. personata*, some specimens of the latter from Honduras being precisely similar, but average slightly deeper gray, especially on the rump, upper tail-coverts and hinder part of pileum, which are practically uniform with the back; but the adult females are exceedingly different, being even paler and grayer than those of *T. s. semifasciata*, with the pileum paler and grayer than the back instead of the reverse. Decidedly the largest form, *T. s. personata*, coming next in size.)

I am not at all sure that it would not be best in accordance with the facts to separate, as additional subspecies, not only the Yucatan birds (from *T. s. personata*) but also the Panama birds (from *T. s. costaricensis*); and it is not unlikely the South American birds may in reality include one or more subspecies in addition to those designated above.

Platypsaris aglaiæ yucatanensis subsp. nov.

Type, No. 130,023, U. S. Nat. Mus., adult male; Yucatan; G. F. Gaumer.

Similar in coloration to *P. aglaiæ aglaiæ*, of northeastern Mexico, but smaller, with relatively larger bill (wing averaging 87.2 in male, 86.8 in female, exposed culmen 17.2 in male, 17.4 in female, the corresponding average measurements of *P. a. aglaiæ* being: Wing 94.8 in male, 93.9 in female; exposed culmen 16.3 in male, 16.6 in female).

Yucatan.

Lathria unirufa clara subsp. nov.

Type, No. 53,767, U. S. Nat. Mus., adult male; Panama (Lion Hill station?); J. McLeannan.

Similar to *L. unirufa unirufa* (of southeastern Mexico to Guatemala) but general coloration decidedly clearer or brighter, inclining to dull cinnamon-rufous above, the under parts clear tawny-ochraceous; averaging decidedly smaller.

Nicaragua to northern Colombia.

Lathria fusco-cinerea guayaquilensis subsp. nov.

Type, No. 101,271, U. S. Nat. Mus., adult; Guayaquil, western Ecuador, 1884; Dr. Wm. H. Jones, U. S. N.

Similar to *L. fusco-cinerea fusco-cinerea* (Lafresnaye), of Colombia, but gray of under parts much more strongly tinged with buffy olive, under tail-coverts much browner, and remiges darker; slightly smaller.

Western Ecuador.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON THE MAMMALS OF GRAND MANAN, N. B., WITH A DESCRIPTION OF A NEW SUBSPECIES OF WHITE-FOOTED MOUSE.

BY MANTON COPELAND AND MORTON L. CHURCH.

The following paper is the result of a visit made to Grand Manan by the authors lasting from September 16 to 24, 1905, nearly all of that time being spent at Grand Harbor.

The collecting of specimens was all done near Grand Harbor on the main island, our success in this being due largely to the assistance of Mr. Leonard Foster, to whom we wish to express our gratitude. We wish to thank also Mr. Outram Bangs for the generous use of his collection, and Mr. Wilfred H. Osgood and Dr. Glover M. Allen for assistance in the identification of specimens.

Odocoileus virginianus borealis (Miller).

NORTHERN VIRGINIA DEER.

We were told that deer were formerly common on the island, but from all that we could learn they have been extinct for fifteen or twenty years.

Sciurus hudsonicus gymnicus Bangs.

RED SQUIRREL.

The red squirrel is much in evidence on Grand Manan and very abundant. We found it plentiful about Grand Harbor and common at Southern Head. On our tramps along the logging paths and through the woods their chattering notes greeted us on every side, and they seemed equally at home in the low growth of moist localities, or among the larger and drier spruce and deciduous woods.

Their food consisted almost entirely of spruce cones, which we noted everywhere pulled to pieces and scattered over the fallen trees, stumps and moss.

A series of thirty-six specimens was collected and carefully compared with the mainland squirrels. Owing to their great abundance it would seem as if they must have been on the island for many years, but no evident differentiation has resulted, and they are entirely referable to *gym-*

nicus. As the validity of this subspecies is somewhat questioned, and rests principally on size, the following table of measurements may be of interest. Both body and cranial measurements of the Grand Manan specimens are strikingly close to those of *gymnicus* from the mainland.

AVERAGE MEASUREMENTS OF ADULT *Sciurus hudsonicus gymnicus*.

Total length.	Tail vertebrae.	Hind foot.	
291.7	108.2	44.9 (11 specimens)	8 Grand Manan, N. B.
297.8	120.5	45.2	8 Perry, Me. Coll. of Morton L. Church.
296.5	118.2	45.2	10 Digby, Nova Scotia *
290.0	107.0	45 5	5 South Twin Lake, Me. †
290.2	121.2	44.5	6 Topotypes, Greenville, Me. ‡

SKULLS.

Greatest length.	Basilar length. ⁂	Zygomatic breadth.	Postorbital breadth.	Length of nasals.	
43.5	34.2 (7 specimens)	25.1 (6 specimens)	13.8	13.2	8 Grand Manan, N. B.
43.2	33.7	24.6	13.9	12.7	8 Perry, Me. Coll. of Morton L. Church.
43 7	.....	.....	.....	12.5	12 Upton, Oxford Co., Me. ‖
43.3	.....	.....	13.4	12.3	5 South Twin Lake, Me. †
43.0	.....	.....	13.8	11.8	6 Trousers Lake, N. B. †

Peromyscus canadensis argentatus subsp. nov.

GRAND MANAN WHITE-FOOTED MOUSE.

Type from Grand Harbor, Grand Manan, New Brunswick. Adult ♂. No. 168, coll. of Manton Copeland, Taunton, Mass. Collected September 19, 1905, by Morton L. Church and Manton Copeland.

Distribution.—Island of Grand Manan, New Brunswick.

Characters.—Resembles most closely *Peromyscus canadensis abietorum*, but differs decidedly and constantly, and is easily distinguishable. The color of upper parts is close to slate-gray, and lacks almost completely the dull russet of *abietorum;* dark patch in front of eye pronounced.

Measurements of body and skull average somewhat greater than those of *abietorum*.

Color.—Type: Upper parts slate-gray due to the presence of black-tipped and gray-tipped hairs; mid-dorsal line slightly darker; a few russet-tipped hairs, most abundant on sides and at base of tail; dark patch in front of eye more prominent than in *abietorum;* underparts white, hairs plumbeous at base; hands and feet white; tail sharply bicolor, black dorsally, white ventrally.

* Bangs, O., Proc. Biol. Soc. Wash., X, p. 160, Dec. 28, 1906.

† Allen, J. A., Bull. Amer. Mus. Nat. Hist., X, pp. 255–256, July 22, 1898.

‡ Bangs, O., Proc. New Eng. Zoöl. Club, 1, pp. 27–29, March 31, 1899.

⁂ Thomas, O., Proc. Biol. Soc. Wash., XVIII, pp. 191–196, Sept. 2, 1905.

‖ Allen, J. A., Mon. N. Amer. Rod., p. 688, 1877.

Twenty-three adult topotypes show no appreciable variation from the type.

The younger specimens differ only slightly from the old,—their general color is a little more gray owing to the presence of but few russet hairs. No very small young were obtained.

Measurements.—Type: Total length, 179.5; tail vertebrae, 87; hind foot, 21.5; ear, 17.5 mm.

Skull: Greatest length, 26.4; basilar length, 20; palatilar length, 11; zygomatic breadth, 13.7; mastoid breadth, 11.1; interorbital breadth, 4; length of nasals, 10.3; length of upper molar series, 3; length of lower molar series, 3.4; length of single half of mandible, 16.4 mm.

Average measurements of twenty-three adult topotypes: Total length, 179.9 (171–194); tail vertebrae, 87.8 (82–93); hind foot, 21.2 (20–22).

Average cranial measurements of ten adult topotypes: Greatest* length, 25.6 (25.1–26.5); basilar* length, 19.4 (19–20.1); palatilar* length, 10.8 (10.5–11.2); zygomatic breadth, 13 (12.7–13.4); interorbital breadth, 3.9 (3.7–4); length of nasals, 10 (9.6–10.4).

Average measurements of twelve adult topotypes of both sexes of *Peromyscus canadensis abietorum* from collection of E. A. and O. Bangs: Total length, 172.7; tail vertebrae, 87; hind foot, 19.9 mm.

Average cranial measurements of eight of the same: Greatest length, 24.7 basilar length, 18.8; palatilar length, 10.2; zygomatic breadth (seven specimens), 12.2; interorbital breadth, 3.8; length of nasals, 9.7 mm.

From the above it may be seen that *argentatus* averages slightly larger than *abietorum* in body and foot measurements, and in all cranial measurements.

Remarks.—This beautiful silvery gray deer mouse, so strikingly different in color from its relatives of the coast, is a typical example of an insular race which, through isolation and close interbreeding, has developed characters quite its own. It inhabits the dark thick growths of spruce and fir, the more open mixed woods of conifers, birch, and beech, or some wooded hillside strewn with numerous decaying stumps and prostrate trunks. Here it makes its home in the underground passages beneath stumps and the moss covered roots of trees, and runs through the rich carpet of moist sphagnum so characteristic of the northern woods.

The mouse is common about Grand Harbor and we took forty in our traps,—baited with rolled oats,—all of which were preserved and examined.

Microtus pennsylvanicus (Ord).

MEADOW MOUSE.

The meadow mouse proved to be a common species in the vicinity of Grand Harbor, and we took over seventy in our traps. They inhabited almost all the localities in which we trapped, and were equally abundant in the wet meadows and dry fields, or with the white-footed mice in the moist evergreen woods and along the edges of the heavier timber.

* Thomas, O., Proc. Biol. Soc. Wash., XVIII, pp. 191–196, Sept. 2, 1905.

Thirty-six specimens, both old and young, were preserved and examined. The adults measured considerably larger than typical *pennsylvanicus*, but showed no appreciable differences in coat color or cranial characters.

Lepus americanus virginianus (Harlan).

EASTERN VARYING HARE.

The varying hare, formerly abundant on the island, appears to be extinct and evidently has been so for a number of years. H. Herrick * in his catalogue of the birds of Grand Manan, compiled from visits to the island in 1871–72, refers to "thousands of *Lepus Americanus*." The natives of the island attribute the disappearance of the hare to the introduction of foxes which, according to some, killed them off in the second or third year. Mr. Foster, who is an accurate observer, remembered when they were extremely abundant, and believed that in less than ten years they were all exterminated by the foxes. He had seen none for about twenty years.

A similar instance of destruction wrought by foxes is recorded for Sable Island by J. Dwight, Jr.† Cats and rabbits overran the island, and seven red foxes were introduced from the mainland. "In a single season" the foxes made an end of them all, and continuing to multiply greatly, began to exterminate the sea birds.

The hare is an animal which would fall easy prey to the fox, and this seems a sufficient explanation of its disappearance from Grand Manan.

Phoca vitulina Linn.

HARBOR SEAL.

Eight individuals of this species were seen swimming together, and several others noted along the shore at Grand Harbor. They were reported as common and breeding on the island.

Halichoerus grypus (Fabr.).

GRAY SEAL.

A large white "winter seal," as it was termed, was described to us as occurring on the Yellow Ledges during December, January and February, and breeding there. As this is a large seal and does not conform in breeding habits with the harp seal we feel reasonably certain that it is referable to *H. grypus*. Moreover, John Moses, a local taxidermist, is in possession of an example of this species which was taken off Grand Manan.

The "winter seals" are sometimes killed on the ledges by the fishermen but in general they keep well off the coast, and only occasionally work along the Grand Manan shore.

Cystophora cristata (Erxl.).

HOODED SEAL.

Mr. Foster described perfectly this seal which had been seen for the last three years in the fall and winter at Grand Harbor. We were able to find no further evidence of its occurrence.

* Herrick, H., Bull. Essex Inst., V, No. 2 and 3, March, 1873.

† Dwight, J., Jr., Mem. Nutt. Ornith. Club, No. 2, p. 15, Aug., 1895.

George A. Boardman* in his list of the mammals of Maine and New Brunswick writes of this species: "Often seen on the rocks, Grand Manan and Murr ledges."

Vulpes fulvus (Desmarest).
RED FOX.

About twenty-five or thirty years ago a pair of foxes were brought to Grand Manan by the Pleasant Point Indians of Maine, through the influence of W. B. McLaughlin, and were set at liberty at Southern Head. They multiplied rapidly, and soon overran the island. At low tide they made their way out to some of the neighboring small islands, and destroyed the colonies of Herring Gulls which nested there. C. H. Andros,† writing on the birds of the island in '87, refers to their depredations in the following terms: "The distance to certain of the outlying islands is so short at ebb tide that the foxes have gained access to them, and thus not only have the ground breeders of the main suffered, but those on the pregnable islands, owing to the limited area, are depopulated to even a greater extent, and the former breeding grounds of the Ringnecks are destroyed." Not only did the birds suffer but the hares were also at their mercy, and were probably exterminated by them.

We learned that the foxes attained their greatest abundance about ten years ago, when trappers from Nova Scotia visited Grand Manan and killed them in large numbers. Since then they have decreased rapidly until at present they are only occasionally seen, and we failed in our attempts to secure any specimens during our stay.

Lutra canadensis (Schreber).
OTTER.

The otter is reported as occurring in perhaps two or more of the wilder ponds on the west side of the island. Mr. Foster informed us he had seen an otter slide last year.

Myotis subulatus (Say).
SAY'S BAT.

Several small brown bats were noted at Grand Harbor and North Head, and apparently they were the only species breeding on the island. Two were secured, both of which proved to be *M. subulatus.*

Lasiurus borealis (Müller).
RED BAT.

We saw one specimen of this species in the collection of John Moses. The exact date of its capture was unknown, but it was taken three or four years ago in the fall, and was probably a migrant.

Lasiurus cinereus (Beauvois).
HOARY BAT.

A single specimen was in the possession of John Moses, and was taken about the same time as the red bat. Without doubt it was captured while migrating.

* Boardman, S. L., The Naturalist of The Saint Croix, p. 320, 1903.
† Andros, C. H., Ornith. and Ool., XII, No. 10, p. 173, Oct., 1887.

Vol. XIX pp. 127-132 September 6, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

REVISION OF THE GENUS WISLIZENIA.

BY EDWARD L. GREENE.

Having had occasion to examine minutely the reticulation of the silicles in certain genera of the Cruciferae, I passed to the comparison of these with those of two anomalous members of the family of Capparidaceae, namely *Oxystylis* and *Wislizenia*, the former a rare, the latter a not very common type, both indigenous to the desert regions of the remote Southwest.

One of the generic characters of *Wislizenia*, according to authors, is the reticulate and tuberculate superficies of the nutlet-like one-seeded twin valves of the fruit.

In the process of examining the valves, as they appear in a long series of specimens in the National Museum and in my own herbarium, I found those of the original *Wislizenia refracta* to be in truth, and very beautifully, reticulate as well as slightly tuberculate, this description of valve, or rather nutlet, occurring however in no specimens except such as had come from western Texas and adjacent New Mexico, the peculiar climatic region whence this type species had been derived. These specimens, assorted and separated from the others, left a much more considerable bundle of mounted sheets that were a medley of things not in any way reconcilable with the species *W. refracta*, the name of which was on almost all the labels.

Out of this medley I gathered first a series of sheets, all from a very different climatic region in northern Arizona, in every specimen of which the valves are devoid of any kind of either reticulation or tuberculation and almost smooth; this plant in habit and aspect also very unlike the real *W. refracta*. A third series of sheets differing clearly from both the aforementioned as to foliage as well as fruit seemed as clearly to illustrate a species confined, as it would seem, to the low and heated district of the

Gila Valley in southern Arizona. From another region remote from this and more remote still from Texas and northern Arizona were a series of specimens all with valves strongly ribbed but not reticulate ; while again, and from very far to the northward of what had been regarded as the range of Wislizenia there appeared a member of the genus exhibiting almost the valves of the original Texan species, but in foliage and habit extremely different from all ; so that it became manifest that the genus must needs be revised, and a fair number of excellent geographic species given recognition on characters of the fruit chiefly ; though each species seems to have its own particular area, and is thus rather perfectly isolated, topographically and climatically, from every other.

While pursuing this line of research, Mr. J. N. Rose pleasantly surprised me by bringing forth a series of specimens of his own gathering in Sonora and Lower California, upon which he had undertaken a critical study long since, which study had been interrupted, and these, together with the manuscript on them, he generously submitted to me, as an aid to this general revision. His own Sonoran species, both of them well marked in character, conclude the subjoined list of species mostly new.

Out of the ten species here recognized, all seem true to the original account of the group as a genus of annuals, except one inhabiting the Lower Californian peninsula which seems to be not only of perennial duration, but is even suffruticose, if not indeed altogether shrubby.

In the course of this study, no modification of fruit, such as might tend in any degree to the weakening of the generic character of *Wislizenia* has been observed ; neither does their appear in any of the seven new species, the least habital leaning towards *Oxystylis ;* which genus, still monotypical, might in almost any event be rested on its strange habit, with lateral and densely glomerate inflorescence ; in both which particulars it is most unlike any and every other genus of the family.

KEY TO THE SPECIES BY THE VALVES.

Valves obovoid or pyriform, rounded at apex, either not tuberculate or the tubercles few and low.

Valves short pyriform, with few lines, a well defined reticulation, and a few low tubercles at summit.

1. **W. refracta.**

Valves pyriform, neither obviously lineolate nor at all tuberculate, usually quite smooth. 2. **W. melilotoides.**

Valves shorter, obovoid, with few low ribs, an obscure reticulation, and a few low tubercles at summit. 3. **W. Californica.**

Valves pyriform, closely and sharply lineolate, and with a crown of more prominent but low tubercles. 4. **W. divaricata.**

Valves round-obovoid, with 5 prominent ribs and some reticulation, the summit with a few low tubercles. 5. **W. pacalis.**

Valves short, almost subcylindric, prominently both ribbed and reticulate and with a low tuberculation. 6. **W. scabrida.**

Valves mostly subpyriform, but summit less rounded, usually quite truncate, in most species conspicuously mamillate-tuberculate.

Valves pyriform, closely and sharply lineolate and with some elongated reticulation, the summit crowned with a circle of 5 spreading mammiform tubercles. 7. **W. fruticosa.**

Valves long, subturbinate-pyriform, strongly striate, near the summit fenestrate-reticulate, the summit with a circle of long connivent tubercles. 8. **W. Palmeri.**

Valves short subquadrate-obovate, the lower half strongly ribbed and closely striate, the broad summit traversed by a few elevated ridges. 9. **W. costellata.**

Valves subturbinate above a short cylindric base, the whole ribbed and lineolate, hardly reticulate, the summit with large mammiform tubercles. 10. **W. mamillata.**

1. **Wislizenia refracta** Engelm.

Wislizenia refracta, Engelm. Wisliz. Mem. 99.
——— ———, Gray, Pl. Wright. **1**. 11, t. 2.
——— ———, Gray, Syn. Fl. **1**. 186 in part.

Tall and rather lax not stout glabrous annual: leaflets elliptic or oblong-elliptic, acute at both ends, mostly 2.5–3 cm. long; fruiting racemes slender, 5–10 cm. long: carpels pyriform, marked with a few low ribs or striae and much intervening reticulation, especially toward the rounded summit, this part sometimes with a few low tubercles by no means conspicuous.

Originally from the valley of the Rio Grande about El Paso, Texas, and in adjacent New Mexico; and no specimens yet seen from more westerly stations, to which it might be expected to migrate after the advent of the railways, and where it may yet be found; but, I apprehend, only as a migrant; all western plants at present known exhibiting characters as distinct.

2. Wislizenia melilotoides sp. nov.

Glabrous, stout and low, freely and somewhat fastigiately branched, all the branches short, very leafy, ending each in a short subsessile raceme: leaflets cuneate-obovate, very obtuse, almost truncate, mucronulate, 1–2 cm. long: fruiting racemes narrow, the oldest only 5–7 cm. long; fruit 4 mm. wide; carpels long-pyriform, remarkably smooth and rounded, at most only obscurely lineolate and with traces of two or three tubercles, more usually with none at all.

Vicinity of Holbrook, northern Arizona, apparently first collected by H. H. Rusby, August 20, 1883, No. 581 as in U. S. Herb.; again at Hardy Tank in the same region, by E. O. Wooton, 1892; the most perfect specimens by Miss Myrtle Zuck, at Holbrook, August 4, 1896.

In habit, form and hue of the very copious foliage, and short racemes, this species strongly recalls a yellow-flowered Sweet Clover. Its fruit characters are very strong, the carpels being usually quite smooth, and with a shallow elongated pit or hollow on the sides marking the form of the seed within.

3. Wislizenia Californica sp. nov.

Wislizenia refracta, Greene, Fl. Fr. 247, not of Engelm.

Stout, much branched, the branches elongated, sparingly leafy, copiously floriferous, minutely scaberulous in lines: leaflets commonly oval, obtuse or subtruncate, mucronulate, sometimes narrower and acute, scaberulous along the midvein beneath: carpels short, usually obovoid rather than pyriform, the longitudinal lines or ribs coarse but low and not very salient, somewhat broken into an obscure reticulation at summit and there, as it were, angled by 4 or 5 coarse and low tubercles.

Interior of California, in dry sandy soil from about Tulare northward to Sacramento; abundant about Lathrop; totally distinct from the Texan *W. refracta*.

4. Wislizenia divaricata sp. nov.

Glabrous, very widely and loosely branched, the branches from strongly divergent to quite divaricate, stout, rigid, uncommonly naked-looking, the scattered foliage small for the plant and all but the proper cauline leaves unifoliolate, the leaflets cuneate-oblong, almost pungently acute, 1.5–2 cm. long: racemes many and elongated: fruit 5 mm. wide, the carpels elongated pyriform, being constricted just above the base, marked longitudinally by a prominent narrow reticulation rather than by crowded and unbroken lines, the summit crowned with a circle of about 5 low tubercles.

Southern part of the Colorado Desert in San Diego County, California, collected only by C. R. Orcutt, June 23, 1888, at Bonego Springs; distributed to National Herbarium under No. 1492.

5. Wislizenia pacalis sp. nov.

Wislizenia Palmeri, Brandg. Proc. Calif. Acad. 2 ser. **2**: 128 in part, not of Gray.

Branches stout, often tortuous or flexuous, not quite glabrous, red-dotted or purplish: leaflets always 3, oblong, usually very obtuse or even retuse or emarginate, 2–3 cm. long: racemes remarkably short, sessile: fruit short, only 3–4 mm. wide; carpels mostly round-obovate, in some specimens longer and subpyriform, the prominent striae 5 only, ending in a more or less distinct low tubercle, the intervening spaces conspicuously reticulate.

La Paz, Lower California, 1890, Edw. Palmer, his No. 88 as in U. S. Herb. the type; but collected earlier, namely in 1889 at San Juanico by Brandegee, and at the same place by Anthony in 1897. Also in 1897 it was collected at La Paz by Mr. Rose, No. 1311 as in U. S. Herb.; but these specimens have longer and even acutish leaflets; but the peculiarly reticulate carpels are about the same in all and are far more like those of the Texan and original *W. refracta* than like those of *W. Palmeri*; and Mr. Rose found himself unable to refer them to either species; his label bearing, in his hand, nothing but the name of the genus.

6. Wislizenia scabrida Eastw.

Wislizenia scabrida, Eastw. Bull. Torr. Club, **30**: 490.

Low leafy habit of *W. melilotoides*, and with like broad leaflets, but not fastigiate, the branches widely spreading, the basal rising with a curve, the whole plant even to the margins of the growing leaflets scaberulous: leaflets at apex usually truncate, or not rarely quite retuse: carpels short, not rounded or tapering, short-subcylindric, closely turgid-ribbed, the truncate summit coarsely low-tuberculate.

Apparently common in the vicinity of Tucson, southern Arizona, where it was collected by Lemmon in 1880, Pringle in 1881, and later by Toumey and others.

7. Wislizenia fruticosa sp. nov.

Wislizenia Palmeri, Brandg. Proc. Calif. Acad. 2 Ser. **2**: 128 in part, not of Gray.

Low, compact, suffrutescent, with yellowish and shining bark on woody parts of stem, the flowering branches short, fastigiate, densely leafy, all parts glabrous, yellow-green; leaves with short stout petioles, the 3 leaflets notably unequal, oblong, acutish, the terminal one 3 cm. long, the laterals little more than 2 cm.; racemes short, sessile; pedicels much elongated: fruit about 5 mm. wide; carpels pyriform, but widened at summit into a broad crown of large somewhat spreading tubercles developed abruptly from the termini of the ribs, the intervening striae not crowded on the sides of the carpel, but running into some few distinct reticulations.

Lower Californian species, so far as known collected only by Mr. Brandegee, at Calamujuet, May 11, 1889; the type specimen being in U. S. Herbarium. I see nothing in this type from which one may infer even a

near affinity for *W. Palmeri.* Its leaves are all trifoliolate. Its carpels are short in comparison, and their terminal tubercles are spreading, not convergent as in that; while by its unmistakably suffrutescent or even fairly shrubby habit and duration, it stands alone in a genus all other known species of which are annuals.

8. Wislizenia Palmeri Gray.

Wislizenia Palmeri, Gray, Proc. Am. Acad. 8: 622.

Rather widely and rigidly branched, glabrous: leaves apparently all simple and greatly elongated, the outline linear-oblanceolate, the length 3–5 cm., base tapering, apex obtuse or subtruncate, texture firm, even apparently subsucculent: fruit 7–8 mm. wide; carpels subturbinate-pyriform, strongly but not closely nerved, the intervals as wider toward the summit fenestrate-reticulate, the summit crowned with very prominent mammiform tubercles, these somewhat connivent, or at least not at all spreading.

Maritime sand dunes of the shores of the Gulf of California northward, and about the mouth of the Colorado River; collected by Edw. Palmer, in 1865, and again by D. T. MacDougal in 1904; not otherwise known to me.

9. Wislizenia costellata Rose sp. nov.

Growing parts minutely and sparsely scaberulous; whole herbage more than usually glaucous, the branches very leafy, somewhat tortuous: leaves and their petioles of about equal length; leaflets cuneate-obovate, obtuse, only 1.5–2 cm. long: racemes subsessile, 1–1.5 dm. long: fruit only 3 mm. wide, the carpels at summit almost as thick as long, truncate at both ends, marked longitudinally by 5 or 6 ribs and many intervening closely compacted striae, the main ribs gradually thicker toward the summit where each ends in a stout low tubercle.

Sonora, Mexico, between Nogales and Guaymas, June 4, 1897, J. N. Rose, No. 1294; type specimens in the U. S. National Herbarium. Easily distinct from *W. refracta* by the very short and thick strongly ribbed carpels, which are also truncate at the apex.

10. Wislizenia mamillata Rose sp. nov.

Glabrous; leaves on slender petioles nearly as long as the leaflets, the latter also conspicuously petiolulate, the blades narrowly oblong, acutish, 2–3 cm. long: fruiting raceme stout and elongated, 1–2 dm. long, short-peduncled: fruit about 6.5 mm. wide, the carpels shuttle-cock-shaped, coarsely and somewhat turgidly striate, not at all reticulate, somewhat constricted above the base, thence abruptly widening to a broad and strongly mamillate-tuberculate summit.

Guaymas, Sonora, Mexico, June, 1887, Edw. Palmer, No. 74, also by J. N. Rose at the same place, June, 1897, Dr. Palmers' specimens having been distributed for *W. Palmeri;* but in characters of fruit the plant is extremely different from *W. Palmeri*, and even the foliage is all trifoliolate, while in *W. Palmeri* all the leaves are simple, or unifoliolate.

Vol. XIX, pp. 133-142 September 25, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DIAGNOSES OF NEW SPECIES OF MOSQUITOES.

BY HARRISON G. DYAR AND FREDERICK KNAB.

The following new species of mosquitoes have been found in our study of the material collected for the Carnegie monograph of the mosquitoes of North and Middle America, and preliminary diagnoses are here given of them. In all cases where more than one locality is mentioned the type locality is given first.

Genus PSOROPHORA Robineau-Desvoidy.

Psorophora virescens sp. nov.

Close to *P. howardii* Coquillett, but the abdomen above metallic green shining instead of blue. The species is also somewhat smaller.

35 specimens, Almoloya, Acapulco, Tehuantepec, Salina Cruz, Mexico; Puntarenas, Costa Rica (F. Knab); Manzanillo, Mexico (A. Dugès); Monterey, Mexico (J. Goldberger).

Type.—Cat. No. 9966, U. S. Nat. Mus.

Psorophora saeva sp. nov.

Black with blue reflection, the legs with dense, short, outstanding scales; tips of posterior femora white. Whitish scales on sides of head and a line at least on thorax, but this is denuded. Wings smoky blackish.

3 specimens, Trinidad, B. W. I. (F. W. Urich); Trinidad, June (A. Busck).

Type.—Cat. No. 9964, U. S. Nat. Mus.

Psorophora iracunda sp. nov.

Black with metallic blue luster, the legs with abundant outstanding scales, long and squammose. Posterior femora slightly grayish at tip. Wings smoky clouded.

5 specimens, Puntarenas, Costa Rica (F. Knab).

Type.—Cat. No. 9965, U. S. Nat. Mus.

Genus CULISETA Felt.

Culiseta maccrackenae sp. nov.

Proboscis black; thorax with two brown stripes, the vestiture yellowish over black. Wings with brown stains in the membrane where the scales

form small black patches at cell, on cross-veins and at bases of forked cells; abdomen black with narrow whitish basal segmental bands, whitish scaled ventrally. Legs black, the femora pale at base and with a white ring before tip; tibiae with a line of white scales on each side; hind tarsal joints banded with white at base nearly to middle.

1 ♂, 4 ♀, Stanford University, California, March, June 23, 1903 (Miss MacCracken); Eureka, Cal., June 8 (H. S. Barber); San Francisco, Cal., July 4, 1906 (Miss Ludlow).

Type.—Cat. No. 9961, U. S. Nat. Mus.

Culiseta dugesi sp. nov.

Proboscis black with a few white scales; thorax with two brown stripes, the vestiture yellowish over black. Wings with brown stains in the membrane where the scales form small black patches on cell, on cross-vein and at bases of forked cells; abdomen black with narrow white basal segmental bands, whitish scaled ventrally. Legs black, sprinkled with whitish scales, the femora pale at base with a white ring before the tip; tibiae with a line of white scales on each side; hind tarsal joints banded with white at base for less than one-fourth their length.

5 ♀, Guanajuato, Mexico, January 20, 1905 (A. Dugès); Mexico City, Mex., October 26, 1900 (S. Arara).

Type.—Cat. No. 9962, U. S. Nat. Mus.

Genus JANTHINOSOMA Lynch-Arribalzaga.

Janthinosoma vanhalli sp. nov.

Hind legs with outstanding scales; thorax golden yellow scaled above; no blue spot on the last two abdominal segments below; else as in *J. sayi* Dyar & Knab.

7 specimens, Paramaribo, Surinam (Dr. Van Hall, through U. S. Dept. Agriculture).

Type.—Cat. No. 9967, U. S. Nat. Mus.

Janthinosoma champerico sp. nov.

Hind legs with raised scales; last two joints of hind tarsi white; abdomen all yellow scaled below; else as in *J. lutzii* Theobald.

One specimen, Champerico, Guatemala (F. Knab).

Type.—Cat. No. 9968, U. S. Nat. Mus.

Janthinosoma coffini sp. nov.

Hind legs without raised scales; tarsi without pale basal bands; penultimate joint of hind tarsi white, the last dark; thorax all yellow scaled above; tips of mid and hind femora dusky. Agrees with the description of *J. varipes* Coquillett, but a careful examination of the types of that species shows there to be dark scales on the center of the thorax and that it is a synonym of *J. discrucians* Walker, as identified by Coquillett.

8 specimens, Nassau, Bahamas, B. W. I., June 22, 1903 (T. H. Coffin).

Type.—Cat. No. 9969, U. S. Nat. Mus.

Janthinosoma schwarzi sp. nov.

As in *J. coffini* Dyar & Knab, but the tips of the hind femora are pure white.

One specimen, Cayamas, Cuba, May 7 (E. A. Schwarz).

Type.—Cat. No. 9970, U. S. Nat. Mus.

Janthinosoma texanum sp. nov.

Hind legs without raised scales; tarsal joints with pale basal bands; first hind tarsal joint with a narrow white ring; thorax golden brown; white ring of the first hind tarsal joint one-third or more as broad as the joint. Else as in *J. jamaicensis* Theobald.

7 specimens, Brownsville, Texas, May 21, 1904 (H. S. Barber).

Type.—Cat. No. 9971, U. S. Nat. Mus.

Janthinosoma floridense sp. nov.

As in *J. texanum* Dyar & Knab, but the thorax violet blue. The pale abdominal bands are powdery, interrupted dorsally and confused; the general color, including the wings, is dark, and the third vein has scale tufts throughout its length, instead of at base only.

105 specimens, Tampa, Kissimmee, Sanford, Arcadia, Bartow, Pokatee, Alligator Creek, Florida (Dyar & Caudell).

Type.—Cat. No. 9972, U. S. Nat. Mus.

Janthinosoma toltecum sp. nov.

As is *J. floridense* Dyar & Knab, but the pale abdominal bands are extensive, broken only on the last segments; the scales on the scutellum have a silvery luster.

89 specimens, Tehuantepec, Salina Cruz, Rincon Antonio, Santa Lucrecia, Almoloya, Mexico (F. Knab); Vera Cruz, Mexico (G. E. Beyer); Dallas, Texas, September 14 (W. E. Hinds).

Type.—Cat. No. 9973, U. S. Nat. Mus.

Janthinosoma columbiae sp. nov.

As in *J. toltecum* Dyar & Knab, but the abdomen more strongly pale scaled, the third vein with the broad scales in a basal dot only, the scutellum without silvery luster.

59 specimens, Grassymead, Va. (H. G. Dyar); Del Ray and St. Elmo, Va. (F. C. Pratt); Woodstock, Va. (J. Kotinsky); Delair, N. J. (W. P. Seal); Cold Spring Harbor, N. Y. (F. E. Lutz); Greensboro, N. C. (F. C. Pratt); Tutnila, Jackson, Belzoni, Clarksdale, Corbin, Yazoo City, Miss. (H. S. Barber); Agricultural College, Miss. (G. W. Herrick); Baton Rouge, La. (J. A. Morgan).

Type.—Cat. No. 9974, U. S. Nat. Mus.

Janthinosoma insularius sp. nov.

Hind legs without raised scales; tarsi with pale bands; first hind tarsal joint without a white ring; wings with whitish and dark scales intermixed;

legs pale, the yellowish scales predominating. Else as in *J. pygmaeus* Theobald.

8 specimens, Santo Domingo, W. I. (A. Busck).

Type.—Cat. No. 9975, U. S. Nat. Mus.

Genus ANOPHELES Meigen.

Anopheles vestitipennis sp. nov.

Tarsi banded with white, the hind tarsi black and white, both tarsi and femora speckled; wing veins black scaled with many little yellow patches.

23 specimens, Trece Aguas, Alta Vera Paz, Guatemala, April 7 to 14, 1906 (Schwarz and Barber); Polochic River, Guat., May 1, 1906 (Schwarz and Barber); Panzos, Guat., June, 1904 (O. F. Cook), March 23, 1906 (Schwarz and Barber); Nautla, Mexico (A. Dugès); Palizada, Mex. (A. Dugès); Cayamas, Cuba, May 22, "in the house" (E. A. Schwarz).

Type.—Cat. No. 9976, U. S. Nat. Mus.

Anopheles strigimacula sp. nov.

Tarsi banded with white, the hind tarsi black and white, both tarsi and femora speckled; wing veins white with black dots and spots; third vein with a small black dot at base or beyond; wing scales narrow; tarsi black and white, not yellow; no distinct costo-apical black spot on wing; last vein with three black dashes.

One specimen, Cordoba, Mexico (F. Knab).

Type.—Cat. No. 9977, U. S. Nat. Mus.

Anopheles apicimacula sp. nov.

As in *A. strigimacula* D. & K., but with a distinct black costo-apical spot on wing.

26 specimens, Livingston, Guatemala, May 11, 1906 (H. S. Barber); Cordoba, Mexico (F. Knab); Colon, Panama (A. I. Kendall); Trinidad, B. W. I. (F. W. Urich).

Type.—Cat. No. 9978, U. S. Nat. Mus.

Anopheles punctimacula sp. nov.

As in *A. strigimacula* D. & K., but the last vein with a row of black dots.

One specimen, Colon, Panama, February 2, 1904 (W. M. Black).

Type.—Cat. No. 9979, U. S. Nat. Mus.

Genus SABETHES Robineau-Desvoidy.

Sabethes bipartipes sp. nov.

Proboscis black; palpi and head metallic blue; thorax olive green with two broad, deep blue discal stripes, the prothoracic lobes blue; pleurae and coxae silvery; abdomen dark metallic blue above, greenish towards the base, venter golden with silvery basal segmental bands; first segment entirely silvery underneath. Legs, the middle pair with the second and outer third of first tarsal joints with a long flattened fringe, black, the apical half of the fringe of the second segment creamy white, the leg deep metallic blue. Front and hind legs simple, blue.

Two specimens, Santo Domingo, West Indies (F. E. Campbell; A. Busck).

Type.—Cat. No. 9980, U. S. Nat. Mus.

The same, or a similar species has been described by Theobald as the male of his *Sabethes nitidus* (Mon. Culic., ii, 347, 1901); but the type of *nitidus* is clearly the female there described, is referable to the section *Sabethoides*, in which the tarsi are not plumed, thus leaving the present species nameless.

Genus LESTICOCAMPA Dyar & Knab.

The species on which this genus was founded appears now to be undescribed. It was identified by Coquillett, and accepted by us, as *Joblotia lunata* Theobald. But Theobald states positively that *lunata* has the clypeus hairy, thus being properly referable to *Joblotia*, which is not the case with the form before us. Therefore, unless Theobald has made an error of observation, our species is distinct. *Lesticocampa* is allied to *Runchomyia*, rather than *Joblotia*, but differs in the absence of the conical frontal process of that genus. The eyes are contiguous vertically, the prothoracic lobes well separated. The type species is:

Lesticocampa rapax sp. nov.

♂; head clothed with dull violet scales behind, with a row of black erect forked scales; thorax with dull brown scales with faint purple reflection; pleurae and coxae silvery; abdomen dull steel blue, violaceous in certain light the first segment with brighter blue scales, 8th with bright violet scales, golden at the sides; venter golden; last segment bright violet blue with numerous bristles below. Legs entirely violet blue. Palpi longer than the antennae, upcurved.

♀; similar to the male, palpi short, as long as four joints of the antennae.

1 ♂, Trinidad, B. W. I. (F. W. Urich), bred from larvae described as *Lesticocampa lunata* Theob. (Dyar & Knab, Journ. N. Y. ent. soc., xiv, 226, 1906); 3 ♀, Sao Paulo, Brazil (A. Lutz); Patulue, Guatemala (D. G. Eisen).

Type.—Cat. No. 9981, U. S. Nat. Mus.

Lesticocampa vonplesseni sp. nov.

♀; head with dull indigo blue scales behind; palpi as long as six joints of the atennae, black; thorax elongate, with sooty scales; abdomen dull blue above, golden below; legs black with blue reflection.

4 specimens, upper Pastazza River, Ecuador (Baron von Plessen, through Dr. M. Graham).

Type.—Cat. No. 9982, U. S. Nat. Mus.

Lesticocampa leucopus sp. nov.

Palpi of ♀ as long as six joints of the antennae; hind tarsi white at tip.

5 specimens, Bluefields, Nicaragua (W. F. Thornton); Bocas del Toro, Panama (P. Osterhout).

Type.—Cat. No. 10,003, U. S. Nat. Mus.

Lesticocampa ulopus sp. nov.

Palpi of ♀ as long as six joints of the antennae; mid and hind tarsi white at tip.

One specimen, Bluefields, Nicaragua (W. F. Thornton).

Type.—Cat. No. 10,004, U. S. Nat. Mus.

Genus WYEOMYIA Theobald.

Wyeomyia vanduzeei sp. nov.

Head brown with a silvery patch at vertex and one on each side of the occiput; proboscis black; prothoracic lobes silvery; thorax brown with two white spots in front; pleurae silvery; abdomen blackish with bluish luster, white below; legs dark, pale beneath, middle pair with tip of third, fourth, fifth joints pale above; from side view the tarsal joints of hind legs show white at base.

12 specimens, Estero, Florida (J. B. VanDuzee), bred from larvae in leaves of Bromelias.

Type.—Cat. No. 9988, U. S. Nat. Mus.

Wyeomyia bromeliarum sp. nov.

We propose this term for the larvae described by us as *W. asullepta* Theob. (Journ. N. Y. ent. soc., xiv, 228, pl. xv, fig. 69, 1906). The single bred adult has, most unfortunately, been nearly entirely destroyed since it was identified by Mr. Coquillett, and we are unable to check the identification. There is no reason, however, to suppose it the same as the continental form, *asullepta*.

Type.—Cat. No. 9989. U. S. Nat. Mus.

Wyeomyia bahama sp. nov.

Proboscis black, bronzy beneath, rather short, much thickened at the tip; head black, a white spot at vertex, silvery at the sides; prothoracic lobes silvery; thorax bronzy brown; pleurae and coxae silvery; abdomen black above, silvery white below. Femora and tibiae blackish, pale beneath; second to fifth joints of tarsi of hind feet whitish at base from side view.

16 specimens, Tarpon Bay, Bahama Islands (T. H. Coffin).

Type.—Cat. No. 9990, U. S. Nat. Mus.

Wyeomyia violescens sp. nov.

Head black, a silvery spot on vertex; proboscis black; prothoracic lobes pearly violet; thorax bronzy brown, scales towards the margin more metallic; pleurae and coxae silvery; abdomen black with bluish reflection, silvery beneath; legs blackish, femora and tibiae pale beneath, middle pair with part of third, fourth and fifth tarsal joints pale above; hind pair with the tarsi laterally white at the bases of the joints.

8 specimens, Cayamas, Cuba, May and June (E. A. Schwarz).

Type.—Cat. No. 9991, U. S. Nat. Mus.

Wyeomyia minor sp. nov.

Head blackish, a silvery spot on vertex; proboscis black; prothoracic lobes silvery white; thorax light bronzy brown; pleurae and coxae silvery;

abdomen black, pale beneath; legs dark, femora and tibiae pale below, middle pair without whitish on tarsi above; hind pair with the tarsi from side view silvery at the bases of the joints.

7 specimens, Baracoa, Cuba, September, 1901 (A. Busck).

Type.—Cat. No. 9992, U. S. Nat. Mus.

Wyeomyia guatemala sp. nov.

Prothoracic lobes silvery white; head black on the occiput, a very narrow white margin to the eyes, distinct at vertex and sides, nearly obsolete at the middle. Body and legs colored as in the other species of this group.

Two specimens, Trece Aguas, Alta Vera Paz, Guatemala, April (Schwarz and Barber).

Type.—Cat. No. 9994, U. S. Nat. Mus.

Wyeomyia fratercula sp. nov.

Prothoracic lobes silvery white; head black behind, a square, diagonally placed, white spot on the vertex, the sides below also white; front tibiae above bronzy with only a slight blue reflection.

One specimen, Martinique, W. I., July (A. Busck).

Type.—Cat. No. 9995, U. S. Nat. Mus.

Wyeomyia sororcula sp. nov.

Prothoracic lobes silvery white; head black behind, a square, diagonally placed, white spot on the vertex, the sides below also white, less broadly and squarely so than in *W. fratercula;* front tibiae dark metallic-blue above.

53 specimens, San Francisco Mts., Santo Domingo, W. I., August and September (A. Busck).

Type.—Cat. No. 9996, U. S. Nat. Mus.

The larva of this species has been described under the name *Wyeomyia grayii* Theob. (Journ. N. Y. ent. soc., xiv, 228, 1906), as identified by Mr. Coquillett. *W. grayii* was described from Santa Lucia, and is most probably specifically distinct from any of the forms before us. We can not be clear on this point, for Theobald's description of *grayii* makes no mention of the color of the prothoracic lobes, so we do not even know if *grayii* belongs to the present group. However, each island seems to have its own species in this group of *Wyeomyia*, and the rule will probably hold good in this case.

Wyeomyia pseudopecten sp. nov.

Prothoracic lobes entirely dark; occiput blackish with a lighter brown central stripe; eyes broadly margined with white.

8 specimens, Trinidad, B. W. I. (A. Busck, F. W. Urich).

Type.—Cat. No. 9997, U. S. Nat. Mus.

The larvae of this form were described as *W. ulocoma* Theob. (Journ. N. Y. ent. soc., xiv, 229, pl. xvi, fig. 73, 1906), following Mr. Coquillett's determination, with which we can not agree after seeing the specimens. *W. ulocoma* was described from Guiana and is, no doubt, a distinct species.

Wyeomyia melanocephala sp. nov.

Prothoracic lobes entirely dark bluish; head dark behind, without white margin to the eyes; hind feet with the last two tarsal joints white.

One specimen, Trinidad, B. W. I. (A. Busck).

Type.—Cat. No. 9998, U. S. Nat. Mus.

Wyeomyia glaucocephala sp. nov.

Prothoracic lobes entirely dark; occiput green and blue, the eyes with a white margin which narrows centrally.

7 specimens, Santo Domingo, W. I. (A. Busck).

Type.—Cat. No. 9999, U. S. Nat. Mus.

The larva of this species was included with the larva of *W. ulocoma* in our description, cited above. They are doubtless similar; but perfect material will probably enable them to be separated.

Wyeomyia adelpha sp. nov.

Prothoracic lobes entirely dark; head dark behind, the eyes with an even white margin; middle legs with white marks on the tarsi.

11 specimens, Esparta, Costa Rica (F. Knab).

Type.—Cat. No. 10,000, U. S. Nat. Mus.

Wyeomyia galoa sp. nov.

Prothoracic lobes entirely dark; head dark behind, the eyes with an even white margin; feet all dark.

3 specimens, Trece Aguas, Alta Vera Paz, Guatemala (Schwarz and Barber).

Type.—Cat. No. 10,001, U. S. Nat. Mus.

Wyeomyia chalcocephala sp. nov.

Prothoracic lobes entirely dark; head bronzy behind, the eyes with a white margin that is narrowed centrally.

7 specimens, Trece Aguas, Alta Vera Paz, Guatemala (Schwarz and Barber), and others, presumably the same, but badly denuded of scales, from Aguna, Guatemala (D. G. Eisen) and Bocas del Toro, Panama (P. Osterhout).

Type.—Cat. No. 10,002, U. S. Nat. Mus.

Wyeomyia celaenocephala sp. nov.

Prothoracic lobes all dark brown or blue; eyes without a white border; no vertical white patch; hind feet all dark, without white spots.

One specimen, Trece Aguas, Alta Vera Paz, Guatemala (Schwarz & Barber).

Type.—Cat. No. 10,006, U. S. Nat. Mus.

Wyeomyia espartana sp. nov.

Prothoracic lobes dark centrally, the tips distinctly white. Similar to *W. ochrura* Dyar & Knab, but the lobes are darker and more contrastingly colored, black centrally with a distinct white tip.

One specimen, Esparta, Costa Rica (F. Knab).

Type.—Cat. No. 10,005, U. S. Nat. Mus.

Wyeomyia ochrura Dyar & Knab.

This species, which we described from larvae from Santo Domingo, Dominica and Trinidad, proves to be unusually widely spread. We have the adults also from Salvador, Guatemala, Mexico and Jamaica, and both larvae and adults from southern Florida, the latter collected in the leaves of bromeliaceous plants by Mr. J. B. Van Duzee. Unlike most of the *Wyeomyia*, it seems not to run to local forms, the Florida larvae even being the same as the Trinidad ones. The adult is readily recognized by the small white tip of scales on the prothoracic lobes, which are violaceous brown centrally.

Genus PHONIOMYIA Theobald.

This genus differs from *Wyeomyia* by the eyes being contiguous at the vertex and in the greater length of the proboscis, which is not swollen at tip. It will probably rank as a good genus, although not as sharply defined on larval characters as the other genera of Sabethinae which we have recognized. There is a distinct larval type represented by our figures 74 and 77 (Journ. N. Y. ent. soc., xiv, plate xvi, 1906). The adult of figure 74 we would now call *Phoniomyia trinidadensis* Theob., as the Brazilian form, *longirostris* Theob., presents differential characters, as shown by a specimen which we owe to the kindness of Dr. Lutz. The *P. trinidadensis* adults, bred from our larvae, are typical *Phoniomyia*. The other species, fig. 77, has a similar larva, but the single bred adult is a typical *Wyeomyia*, with a short proboscis, swollen at tip. We are at present unable to decide whether there is a lack of parallelism between these genera in adults and larvae, or whether some error has occurred in the association of our *Wyeomyia autocratica* larvae and the single bred adult.

Phoniomyia homotina sp. nov.

Tarsi without any white; abdomen and legs blackish with a dark blue sub-metallic reflection. A large species like *P. magna* Theobald, but differing therefrom in the color of the body and legs.

5 specimens, Port Limon, Costa Rica (F. Knab); Trece Aguas, Alta Vera Paz, Guatemala, March and April (Schwarz and Barber).

Type.—Cat. No. 9993, U. S. Nat. Mus.

Phoniomyia trinidadensis Theobald.

The male, previously undescribed, differs from the female in having the penultimate joint of the middle tarsi with a distinct white ring. The specimen was bred in Trinidad by Mr. F. W. Urich.

Vol. XIX pp. 143-154 September 25, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF NEW SPECIES OF ACORIDIUM FROM THE PHILIPPINES.*

BY OAKES AMES.

The following list of new orchids is based on recent collections made in the Philippine Islands. I have divided the species into two sections, designating as *Euacoridium* all those species which lack lateral arms of the column, and designating as *Platyclinis* all those which have such arms. The former section is represented in the Philippines by more species than the latter and is based on *Acoridium tenellum*, Nees & Meyen. Unless otherwise specified, the type specimens are in the herbarium of the Bureau of Science, Manila, and duplicate types are in my own herbarium. They will all be illustrated in the serial *Orchidaceae*, issuing from the Ames Botanical Laboratory.

§ 1. EUACORIDIUM.

Acoridium Williamsii sp. nov.

Pseudobulbi caespitosi, fusiformes; folia linearia, setaceo-triangularia; pedunculi quam foliis breviores; flores distichi; sepala lateralia ovato-lanceolata, acuta, 3-nervia; petala rhombiformi-oblanceolata, acuta, 3-nervia; labellum 3-callosum, 3-lobatum, lobis lateralibus oblongo-falcatis, obtusis, lobo medio oblongo obtuso.

Grass- or rush-like tufted plants, in habit very similar to *A. tenellum*, Nees & Meyen. Pseudobulbs approximate, clustered, fusiform, 7.5 cm. long, tapering from a slender base. Sheaths elongated, tubular, maculate, acute, closely appressed to the pseudobulb. Leaf linear, triangular in cross section, 25 cm. long, about 1 mm. thick, acute. Peduncle filamentous, somewhat shorter than the leaf, from near the summit of which it appears to arise, being for the most part enclosed by it. Inflorescence slender, about 7 cm. long, 5 mm. through. Bracts glumaceous, longer than the ovary, 2 mm. long. Flowers 2–3 mm. apart, in 2 rows, greenish-white, forming a graceful pendulous raceme. Lateral sepals ovate-lanceolate, acute, 3-nerved, 3 mm. long, 1.5 mm. wide. Upper sepal narrower, oblong, 3 mm. long, 1 mm. wide. Petals rhombic-oblanceolate, acute, 3-nerved, about 3 mm. long, 1 mm. wide. Lip 3-lobed or trifid; lateral divisions

* Contributions from the Ames Botanical Laboratory, No. 5.

largest, oblong-falcate, obtuse, with a minute callus at the base of each near the sinus formed with the oblong, obtuse, middle lobe, which is 1 mm. long. Column much like that of *A. tenellum* Nees & Meyen. Fruit not seen.

Type in Herb. New York Botanical Garden, from Trinidad, Prov. Benguet, northern Luzon, September 28, 1904 (growing on rock), R. S. Williams (No. 1939).

An interesting addition to the grass-leaved division of *Euacoridium*, of which, heretofore, *A. tenellum* and *A. sphacelatum* were the only known representatives. From both of these species it is at once distinguished by its stricter habit, thicker, triangular leaves, larger flowers, and very different lip. The flowers at the summit of the raceme begin to expand first, a character which does not hold in *A. tenellum*, *A. sphacelatum* or *A. graminifolium*, in all of which species the lowermost flowers are the first to bloom.

Acoridium graminifolium sp. nov.

Pseudobulbi fusiformes; folia linearia, acuta; pedunculi quam foliis breviores; flores distichi; sepala lateralia lanceolata, acuta, 3-nervia, ad apicem paulo conduplicata; petala lanceolata, acuta, 3-nervia; labellum 3-callosum, 3-lobatum, lobis lateralibus oblongis, ad apicem latioribus, ad basim auriculatis, lobo medio oblongo, mucronato.

Affinity with *A. tenellum* Nees & Meyen. Tufted grass-like epiphytes, with yellow fragrant flowers which turn deep reddish brown when dry. Pseudobulbs stem-like, fusiform, 7–8 cm. long, strongly grooved when old, clothed with elongated, tubular, maculate, acute, closely appressed sheaths, the fibrous remains of which persist. Leaves grass-like, linear, prominently nerved, with a conspicuous mid-rib, at the base contracted into an elongated petiole, above flat, 30 cm. long, 2.5–3 mm. wide, acute. Peduncles filamentous, shorter than the leaves, from near the summit of which they appear to arise, and to the face of which they adhere lightly for a part of their length. Inflorescence 4.5–5 cm. long, 8–10 mm. through, bracts glumaceous, clasping the flowers, about 2 mm. long. Flowers about 2 mm. apart in a rather dense, distichous raceme. Lateral speals lanceolate, acute, 3-nerved, slightly conduplicate at the apex, 4.5 mm. long, 2 mm. wide. Upper sepal similar to the laterals, narrower, about 4 mm. long. Petals lanceolate acute, 3-nerved, broadly clawed, 3 mm. long, about 1.5 mm. wide. Lip 3-lobed, E-shaped; lateral lobes oblong, broadened toward the end, with an auricular or rounded lobe at the base on the outer margin; middle lobe or division oblong, with a sharp mucro at the tip, with a thickened, transverse ridge at the base, which passes into two truncate calli, one at the base of each lateral lobe. In the depression at the center of the lip is a minute callus on the median nerve. Column less than 1 mm. long, stout, similar to the column of *Acoridium tenellum* Nees & Meyen.

Type from between Suyoc and Panai, Prov. Benguet, Luzon, alt. 6,500 feet. October-November, 1905, E. D. Merrill (No. 4764); additional material from Mt. Data, Distr. Lepanto, Luzon, November, 1905, E. D. Merrill (No. 4594).

In *Acoridium graminifolium* we have an interesting and instructive tran-

sition between the filamentous-leaved *A. tenellum* and the broad-leaved *A. venustulum* and *A. pumilum* forms of the section *Euacoridium*. The fleshy flowers, which are nearly opaque, and the very complex lip of *A. graminifolium* distinguish it very clearly from its near allies. The character of the lip is worthy of special attention as the structure of the calli is more like that of the calli of *A. venustulum* and its allied species than like the calli of *A. tenellum*, thus forming a striking transition between the two groups.

Acoridium tenuifolium sp. nov.

Pseudobulbi fusiformes; folia linearia, attenuata, acuta; pedunculi quam foliis breviores; sepala lateralia triangulari-lanceolata, acuta, 1-nervia; petala lanceolata, 1-nervia; labellum 3-lobatum, 3-callosum, lobis lateralibus valde elongatis, oblongis, obtusis, 1-nerviis, lobo medio minuto.

Pseudobulbs fusiform, slender, 1.5–2.5 cm. long, monophyllous. Leaves linear, acute, with a prominent mid-rib, 3–12 cm. long, 2–4 mm. wide, contracted below into a slender petiole 1.5 cm. long. Peduncle exceeded by the leaf, flexuose, 3.5–5.5 cm. long to the lowermost bract of the inflorescence, bracts 2 mm. long, longer than the ovary. Flowers white, less than 2 mm. apart. Lateral sepals triangular lanceolate, 1-nerved, acute, 3 mm. long, 1 mm. wide. Upper sepal 3 mm. long, similar to the laterals. Petals lanceolate, 1-nerved, 2 mm. long. Lip minute, 3-lobed with relatively long lateral lobes, which are erect, oblong, obtuse, and diverted forward, at right angles to the column; the saccate middle lobe, which is fleshy and provided with a pitcher-like tip at the apex, passes at its basal margin, or rim, into thickenings, or calli, one on each side at the sinus formed by the lateral and middle lobe; lateral lobes from sinus to apex, 1 mm. long, 1-nerved.

Type from Mt. Data, Distr. Lepanto, Luzon, alt. 7,000 ft., epiphyte in rain forest, October 29, 1905, Elmer D. Merrill (No. 4576).

While *Acoridium tenuifolium* is closely allied to *A. tenue* and *A. parvulum*, it is very distinct from both, and well characterized by its oblong, 1-nerved lateral lip-lobes and by its acute, attenuated leaves.

Acoridium tenue sp. nov.

Pseudobulbi fusiformes; folia lineari-oblonga, obtusa; pedunculi quam foliis cum petiolis breviores, vel interdum longiores; sepala lateralia linearilanceolata, acuminata, acuta, 3-nervia; petala lineari-lanceolata, acuminata, acuta; labellum 3-lobatum, 3-callosum, lobis lateralibus lunatis, sub-acutis, lobo medio 3-dentato, dentibus lateralibus magis rotundatis, obtusis vel sub-acutis.

Whole plant when in flower 12–18 cm. high, slender throughout. Pseudobulbs 1.5–2.2 cm. long, fusiform, when immature concealed by the tubular, nervose, acute sheaths. Leaves linear-oblong, obtuse, with a minute indentation on the margin on each side above the middle, prominently 3-nerved, 3–6 cm. long, 2–4.5 mm. wide. Petioles slender, 1 cm. long. Peduncles filiform, shorter than the leaf and petiole or sometimes slightly longer, 4.5–8 cm. long. Bracts longer than the ovaries, erose-den-

tate on the margin, 2 mm. long. Flowers 2 mm. apart, in slender, graceful, flexuose racemes. Racemes 2.7–6.3 cm. long. Lateral sepals linear-lanceolate, acuminate, acute, 3-nerved, 3 mm. long, 0.9–1 mm. wide. Upper sepal similar to the laterals. Petals narrowly lanceolate, acuminate, acute, 2.5 mm. long. Lip 3-lobed; lateral lobes diaphanous, semi-crescent-shaped, sub-acute, with a free callus-like appendage at base on the inner margin of each; middle lobe 0.5 mm. long, tridentate, the lateral teeth rounded, obtuse or sub-acute; near the base of the lip on the median line is a minute tubercle or callus. Column minute, similar to that of *A. tenellum* Nees & Meyen.

Type from the trail to Mt. Apo, Mindanao (growing on mossy trees), April 19, 1904, E. B. Copeland (No. 1019*a*); additional material from Lamao River, Mt. Mariveles, Prov. Bataan, Luzon, October, 1903, Elmer D. Merrill (No. 3217*a*).

Acoridium tenue in habit forms a connecting link between the grass-leaved *A. graminifolium* and the broad-leaved *A. rennstulum*. The lip, however, is more like the lip of *A. tenellum*.

Acoridium parvulum sp. nov.

Herbae minutae; folia lineari-oblonga, obtusa, truncata; pedunculi quam foliis longiores; sepala lateralia lanceolata, acuta, 1-nervia; petala lanceolata, acuta, 1-nervia; labellum 3-lobatum, 2-callosum, lobis lateralibus oblongo-falcatis, obtusis, lobo medio retuso-mucronato.

Affinities with *A. tenue*. Whole plant not exceeding 8 cm. in height. Pseudobulbs monophyllous, 4–10 mm. long, clothed with tubular acute sheaths. Leaves linear-oblong, obtuse, truncate, prominently 3-nerved, 2–3.5 cm. long, 2–2.5 mm. wide. Peduncles very slender, slightly longer than the leaves, 3–4 cm. long. Raceme graceful, 1.5–2 cm. long, about 3 mm. through. Bracts acute, longer than the ovary, 1.5 mm. long. Flowers when spread out 4 mm. across. Lateral sepals lanceolate, acute, 1-nerved, 2.5 mm. long, about 1 mm. wide. Upper sepal similar to the laterals, about 3 mm. long. Petals lanceolate, acute, 2 mm. long, 1-nerved. Labellum 1.25 mm. wide, 3-lobed; lateral lobes oblong-falcate, rounded at the apex, erect, clasping the column; middle lobe broader than long, the apex retuse, mucronate. From the inner basal margin of each lateral lobe a thickening, callus-like in its nature, extends to the middle of the middle-lobe, where the two thickenings become confluent. Column minute, with a protuberance in front.

From Lamao River, Mt. Mariveles, Prov. Bataan, Luzon, October, 1903, Elmer D. Merrill (No. 3217*b*).

Acoridium parvulum, which is the smallest member of the genus known to come from the Philippine Islands, resembles closely *A. tenue*, though this is a larger species, with longer leaves, more slender, longer pseudobulbs, longer racemes and narrower, 3-nerved sepals. The leaves of *A. parvulum* do not taper at the base so abruptly as those of *A. tenue*. No. 3217 of Merrill's collections consists of a mixture of *A. parvulum* and *A. tenue*.

Acoridium venustulum sp. nov.

Pseudobulbi fusiformes; folia lineari-oblanceolata; sepala lateralia late ovata, acuta, 1-nervia; sepalum superius lanceolatum, acutum; petala falcata, lineari-lanceolata, acuta; labellum 3-lobatum, 3-callosum, lobis lateralibus ovato-falcatis, obtusis, lobo medio emarginato-mucronato.

Pseudobulbs fusiform, 2 cm. long, monophyllous; leaves linear-oblanceolate, 6–7.5 cm. long, 5–8 mm. wide, rounded at the tip, acute. Petiole 5–10 mm. long, slender. Peduncle 5–7 cm. long, very slender, flexuose, with several imbricating bracts below the inflorescence. Inflorescence 5–7 cm. long, about 5 mm. through, densely many-flowered. Pedicels about 2 mm. apart. Bracts much longer than the ovary, ovate from a broad base, glumaceous, obtuse, 2.5 mm. long. Flowers small, dull yellow, in two rows, forming a graceful drooping raceme. Lateral sepals broadly ovate, acute, 1-nerved, 3 mm. long, 1.5 mm. broad. Upper sepal lanceolate, acute, considerably narrower than the laterals, similar to the 1-nerved, somewhat falcate, linear-lanceolate, acute petals, which are 3 mm. long. Lip minute, somewhat saccate, 3-lobed, from base to tip of midlobe 1 mm. long, about 2 mm. wide; lateral lobes broadly ovate-falcate, obtuse with a thickened, partly free callus at the base of each; middle lobe deeply emarginate, mucronate; sac or depression oblong, with a minute, rounded, keel-like callus in the middle of the bottom. Column minute, 1 mm. long, with a protuberance in front.

From Mt. Santo Tomas, Prov. Benguet, Luzon, May 7, 1904, A. D. E. Elmer (No. 6273).

Acoridium strictiforme sp. nov.

Pseudobulbi fusiformes; folia lineari-oblonga, marginata, acuta; sepala lateralia lanceolata, acuta, 1-nervia; petala lineari-lanceolata, acuta, 1-nervia; labellum 3-lobatum, 3-callosum, lobis lateralibus falcatis, obtusis, lobo medio 3-lobato.

A compact epiphyte about 6 cm. high, with a dense distichous inflorescence of white fragrant flowers. Pseudobulbs fusiform, 1–1.5 cm. long, rugose when dry, monophyllous. Leaves linear-oblong, shortly petioled, coriaceous, acute, 2.5–4 cm. long, 3–5 mm. wide, prominently 3-nerved, the outer nerves marginal, giving the leaves a marginate aspect (at least when dry). Petiole about 3 mm. long. Peduncle shorter than or equalling the leaf, rather strict, filiform. Inflorescence 1.5–2 cm. long, 4–5 mm. through, densely flowered. Bracts broadly ovate, obtuse, erose, dentate on the margin, 2.5 mm. long, exceeding the ovary and clasping the base of the perianth. Lateral sepals lanceolate, acute, 1-nerved, 3 mm. long, less than 1.5 mm. wide; upper sepal similar to but narrower than the laterals. Petals linear-lanceolate, acute, 1-nerved, 3 mm. long, slightly less than .75 mm. wide. Lip 3-lobed, with large falcate, obtuse, diaphanous lateral lobes, 1 mm. long, and with a minute trilobed middle lobe which is fleshy and passes into fleshy calli, situated one on each lateral lobe, on the inner margin near the base; on the median line a minute papilla. Column, with a rostellar process protuberant from the front. Anther very large in proportion to the size of the minute column.

From between Suyoc and Panai, Prov. Benguet, Luzon, October–November, 1905, E. D. Merrill (No. 4854).

This very distinct species is distinguished from its near allies, *A. tenue* and *A. parvulum*, by the very narrow 1-nerved petals, by its strict, almost rigid habit, and by its acute leaves.

Acoridium anfractum sp. nov.

Pseudobulbi oblongi; folia oblonga, acuta vel obtusa, apiculata; pedunculi quam foliis longiores; rachis anfracta; sepala lateralia lanceolata, acuta, 3-nervia; sepalum dorsale elliptico-oblongum; petala obvata, 3-nervia, ad apicem margine erosa; labellum 3-lobatum, lobis lateralibus ad apicem reflexis, lobo medio retuso, mucronato.

Pseudobulbs oblong, 1–3 cm. long, when immature clothed with densely maculate sheaths. Leaves 6–7 cm. long, 7–9 mm. wide, prominently 3-nerved, acute or obtuse, apiculate. Petioles, about 1 cm. long. Peduncle longer than the leaf, with several closely imbricating bracts below the inflorescence. Bracts ovate from a broad base, entire, 6 mm. long, longer than the ovary. Rachis of the inflorescence strongly zig-zag, each internode forming a right-angle with its subtending bract. Flowers 8–9, large for the section, 5–6 mm. apart, brownish-red in a loose raceme. Lateral sepals 6 mm. long, 3 mm. wide, lanceolate, acute, 3-nerved. Upper sepal elliptic-oblong, 6 mm. long, 3 mm. wide. Petals obovate, 5.5 mm. long, 4 mm. wide, somewhat erose on the margin near the tip, 3-nerved, the lateral nerves branched. Lip 4 mm. wide, 3-lobed. Lateral lobes 2.5 mm. long, apex acute, reflexed. Middle lobe retuse-mucronate, acute; margin on each side of the mucro thickened into callus-like protuberances, from each of which a conspicuous vein runs back to the tuberculate or emarginate calli situated one on each side of the disc near the base. Column stout, apex behind the anther crenulate.

From Mt. Data, Distr. Lepanto, Luzon, alt. 7,000 ft., epiphyte, October 20, 1905, Elmer D. Merril (No. 4482).

Acoridium anfractum is most nearly allied to *A. pumilum* Rolfe, from which it differs in the outline and calli of the lip, in the venation of the petals, and in the very conspicuously zig-zag rachis of the larger-flowered raceme.

Acoridium recurvum sp. nov.

Pseudobulbi recurvati, fusiformes; folia lineari-oblonga, acuminata, apiculata; flores distichi; sepala ovata, obtusa, 3-nervia; sepalum dorsale elliptico-oblongum, obtusum; petala obovato-suborbiculata, 3-nervia; labellum 3-callosum, 3-lobatum, lobis lateralibus falcatis, obtusis, lobo medio quadrato, ad angulos rotundato, at apicem dente sive mucrone instructo.

Epiphytes apparently pendulous, with elongated fusiform recurved pseudobulbs. Pseudobulbs 3–4 cm. long, about 3 mm. in diameter, clothed by nigro-punctate, loose sheaths. Leaves linear-oblong, acuminate, apiculate, many-nerved, 10–12 cm. long, 10–14 mm. wide. Petioles slender, 18 mm. long. Peduncles shorter than the leaves. Racemes 2.5–4 cm. long, rather loosely flowered. Bracts 3 mm. long, longer than the ovary. Flowers 10–13 or more, 3 mm. apart, rather fleshy, 6 mm. across when

spread out. Lateral sepals ovate, obtuse, 3-nerved, 4.5 mm. long. Upper sepal elliptic-oblong, 4 mm. long. Petals 4 mm. long, 2.5 mm. wide, obovate, suborbicular, 3-nerved. Lip 3-lobed, from base to tip of mid-lobe 1–1.5 mm. long; lateral lobes falcate, obtuse; middle lobe quadrate, rounded at the angles, with a tooth or mucro at the apex. At the base of each lateral lobe is a thickened callus-like plate, and near the middle of the lip a small tubercle.

From Mt. Data, Distr. Lepanto, Luzon, November, 1905, Elmer D. Merrill (No. 4584).

Acoridium recurvum is most nearly allied to *A. pumilum* Rolfe, although much larger in foliage, and quite different from it in habit. The flowers are fleshy, nearly opaque, and red-brown when dry. The recurved pseudobulbs, which arise from a creeping branched rhizome, and the densely spotted sheaths, which clothe the immature pseudobulb and conceal the petiole and leaf-base, are characters which distinguish this species clearly from all other species of *Acoridium* thus far discovered in the Philippine Islands.

Acoridium philippinense sp. nov.

Pseudobulbi pyriformes; folia oblongo-lanceolata, 5-nervia; sepala lateralia oblongo-lanceolata, acuta, 3-nervia; petala rhombiformi-ovata, 3-nervia; labellum 3-lobatum, ecallosum, lobis lateralibus lineari-lunatis, obtusis, quam lobo medio minoribus, lobo medio oblongo, obtuso.

Pseudobulbs 2 cm. long, somewhat pyriform, monophyllous. Sheaths inflated, nigro-punctate when dry, round, acute at the apex. Petiole 5–6 cm. long, slender. Leaf oblong-lanceolate, acute, strongly 5-nerved, 8.5–11 cm. long, 16–23 mm. wide, broadest above the middle. Peduncle shorter than the petiole and leaf, or longer, 12–16 cm. long, slender. Inflorescence 5–10 cm. long, 1 cm. through. Flowers in a dense raceme, about 2 mm. apart. Bracts glumaceous, longer than the ovary, 2.5 mm. long. Flowers bright yellow, emitting an odor which recalls the smell of freshly sawed pine lumber. Lateral sepals oblong-lanceolate, acute, 4.5 mm. long, 2 mm. wide, 3-nerved. Upper sepal similar, narrower, 4.5 mm. long. Petals rhombic-ovate, acute, 3-nerved, 3.5 mm. long, 2.5 mm. wide. Lip 3-lobed, lateral lobes linear-crescent shaped, obtuse, erect, 1 mm. long, much narrower than the broad oblong-lingulate middle lobe, which is trulliform when not flattened out, blunt at the apex and thickened at the base. Column exalate, 9 mm. long, stout, fleshy; apex rounded.

From between Suyoc and Panai, Prov. Benguet, Luzon, alt. about 6,500 ft., epiphyte, November 7, 1905, Elmer D. Merrill (No. 4757).

This very distinct species belongs to a group of odd forms which appear to have equal affinity with the sections *Platyclinis* and *Euacoridium*.

Acoridium turpe sp. nov.

Pseudobulbi pyriformes; folia oblongo-lanceolata, acuminata, acuta; sepala lateralia ovato-lanceolata, acuta; sepalum dorsale oblongo-ovatum, obtuse; petala ovato-acuta, 3-nervia; labellum 3-lobatum, lobis lateralibus

bene minutis, rotundatis, ad basim labelli approximatis, lobo medio magno, semi-orbiculari, 3-tuberculato.

Pseudobulbs slender pyriform, about 2.5 cm. long. Leaves 9–14 cm. long, 7–18 mm. wide, oblong-lanceolate, acuminate, acute. Petiole 4–7 cm. long. Peduncle shorter than the leaves, flexuose. Bracts glumaceous, 3–4 mm. long. Flowers yellowish, odorless. Lateral sepals ovate-lanceolate, acute, 3 mm. long, 2 mm. wide. Upper sepal oblong-ovate, obtuse, or subacute, 3 mm. long. Petals ovate-acute, 3-nerved. Lip 3-lobed; lateral lobes minute, rounded, basal; middle lobe relatively very long, 2 mm. wide, semi-orbicular, about 1 mm. long, trituberculate, with a tubercle on each side at base near the sinus formed by the lateral lobes and with a papillate tubercle between them. Column stout.

From between Suyoc and Panai, Prov. Benguet, Luzon, epiphyte in mossy forest, alt. about 6,500 ft., November 7, 1905, Elmer D. Merrill (No. 4758).

The lip although unlike those of all other species of *Acoridium* is of great interest inasmuch as the tubercles are in character and location similar to those of such species as *A. pumilum* and *A. venustulum*. In habit the plant resembles *A. Whitfordii* and *A. philippinense*.

Acoridium oliganthum sp. nov.

Pseudobulbi pyriformes; folia oblonga, sub-acuta vel obtusa, quam pedunculo breviora; sepala lateralia late ovata, obtusa, 3-nervia; sepalum dorsale oblongum, obtusum, 3-nervium; labellum sagittatum, 3-lobatum, 3-callosum, lobis lateralibus obtusis.

A diminutive epiphyte with roundish or pyriform, rugose pseudobulbs 5 mm. long, 3.5 mm. thick. Leaves shortly petiolate, 1.7–2 cm. long, 3–5 mm. wide, sub-acute or obtuse. Peduncles longer than the leaves, flexuose, filiform, few flowered. Bracts about 2 mm. long, exceeding the ovaries. Flowers small, brownish-red, orange when dry. Lateral sepals broadly ovate or orbicular-ovate, obtuse, 3-nerved, 2 mm. long, by about 2 mm. wide. Upper sepal oblong, broadest above the middle, obtuse, 3-nerved, 3-mm. long. Petals broadly cuneate-obovate, broadest above the middle, 3-nerved, obtuse or sub-acute, 2 mm. long, slightly more than 2 mm. wide. Lip contracted-sagittate, 3-lobed, with the middle-lobe bluntly apiculate or obscurely 3-lobed and the lateral lobes blunt and rounded with a large truncate tubercle at the base of each near the outer margin, and on the median line or disc of the lip a minute, very obscure papilla. Column short, with a very prominent protuberance in front.

From Mt. Data, Distr. Lepanto, Luzon, alt. 7,000 ft., October 29, 1905, Elmer D. Merrill (No. 4481).

In the Herbarium of the Bureau of Science at Manila this species and *A. ocellatum* are mounted on the same sheet. Both species were collected by Mr. Merrill at the same time. Only four plants were found, two of each species. *A. oliganthum* belongs to that group of *Euacoridium* species which have the lateral lobes of the lip much smaller than the middle lobe and which merge with *A. Whitfordii* and *A. ocellatum*.

Acoridium ocellatum sp. nov.

Pseudobulbi pyriformes; folia oblonga, obtusa; sepala lateralia ovata, obtusa; sepalum dorsale elliptico-oblongum, obtusum; petala ovata; sepala petalaque ocellata; labellum incrassatum, 3-callosum, pentagulare, acutum.

A diminutive, coriaceous-leaved species with ocellate sepals and petals. Pseudobulbs 1 cm. long, about 5 mm. thick, ovate-oblong or pyriform, strongly rugose. Leaves shortly petiolate, oblong, 3.5–4.5 cm. long, 5–6 mm. wide, obtuse. Petioles 5 mm. long. Peduncle about as long as the leaves, few flowered. Bracts 3 mm. long, erose-margined, longer than the ovaries. Lateral sepals ovate, obtuse, 2 mm. long, 1 mm. wide. Upper sepal elliptic-oblong, obtuse, 2 mm. long, 3-nerved, the nerves branched. Petals ovate, about 2 mm. long, 1 mm. wide, like the sepals provided with diaphanous areolae or ocelli scattered among the semi-opaque tissues. Lip fleshy, about 1 mm. long, 1.5 mm. wide, pentangular, acute, the apical angle forming a triangular tooth; near the center on the median line a minute papilla is situated between two truncate tubercles. Column short and stout.

From Mt. Data, Distr. Lepanto, Luzon, alt. 7,000 ft., epiphyte with brownish-red flowers, October 29, 1905, Elmer D. Merrill (No. 4481*a*).

Acoridium ocellatum is readily distinguished from all other Philippine species of the section *Euacoridium* by the scattered ocelli on the sepals and petals.

Acoridium Merrilli sp. nov.

Pseudobulbi fusiformes; folia oblongo-lanceolata, acuta; sepala lateralia lineari-lanceolata, acuta; petala oblongo-lanceolata, quam sepalis breviora, margine minute denticulata; labellum 3-lobatum, lobis lateralibus rotundatis, quam lobo medio emarginato minoribus.

Near *Dendrochilum exalata* J. J. Smith. Pseudobulbs clustered, monophyllous, 2–2.5 cm. long, fusiform, grooved and furrowed when dry, sheaths 2.5–7 cm. long, maculate, acute. Leaf oblong-lanceolate, acuminate, acute, 11–14 cm. long, about 2 cm. wide. Petiole 2.5–3.5 cm. long. The prominently nerved lamina of the leaf, which becomes very dark in color when dried, passes abruptly into the petiole. Peduncle very slender, 0.5 mm. in diameter, naked, without imbricating bracts at the summit below the inflorescence, equalling the leaf or slightly shorter. Inflorescence a loose, graceful, comparatively large-flowered raceme, 1 dm. long, 1.5–2 cm. through. Floral bracts linear-lanceolate, acute, about 3 times longer than the ovary and pedicel, 4–7 mm. long, the slender awn-like apical portion up-curved. Flowers 4 mm. apart. Lateral sepals linear-lanceolate, acuminate, acute, carinate, 3-nerved, 9 mm. long, 2 mm. wide, spreading; upper sepal similar to the lateral ones, of equal length with them. Petals oblong-lanceolate, microscopically and irregularly toothed along the margin, acute, 3-nerved, 6 mm. long. Labellum with 3 thickened nerves, ecallose, 5 mm. long, 3-lobed, the apical lobe much the largest, 3 mm. long and broad, rounded, blunt and emarginate, lateral lobes nearly half round, minutely toothed, obliquely erect. Column rather stout, 2.5 mm. long, apex minutely crenulate, about midway in front a membranaceous protuberance. Fruit not seen.

From Mt. Data, Distr. Lepanto, Luzon, November, 1905, E. D. Merrill (Nos. 4585 (type) and 4858).

This very distinct species, which shows clearly its affinity with *Platyclinis Kingii* Hook f. (Icones Pl. 2015) and with *Dendrochilum exaltatum* J. J. Smith, from which it is readily distinguished by its very different labellum, is represented by two collections made by Elmer D. Merrill on Mt. Data, on the island of Luzon. It is a most interesting addition to the group standing between *Platyclinis* and *Euacoridium*, having the habit of the former and the gynostemium of the latter.

§ 2. PLATYCLINIS.

Acoridium longilabre sp. nov.

Pseudobulbi oblongo-fusiformes; folia lineari-oblanceolata, obtusa, mucronata, valde 3-nervia; perianthii membra inter se fere aequalia, linearioblonga, obtusa vel sub-acuta; labellum integrum, quam sepalis petalisque latius, ad basim 2-lamellatum.

Pseudobulbs 13–33 mm. long, oblong-fusiform, clothed by nigro-punctate sheaths. Leaves linear-oblanceolate, obtuse, mucronate, about 26 cm. long, 15–18 mm. wide, prominently 3-nerved, the lateral nerves giving the leaf the appearance of being marginate-winged. Lamina decurrent on the petiole, which is 10 cm. long. Peduncle shorter than the leaves and petioles, slender, flexuose, 20–30 cm. long. Flowers reddish-brown when dry, in dense, spicate, cylindrical racemes. Racemes 7–8 cm. long. Bracts 4–5 mm. long, subacute, exceeding the ovary. Divisions of the perianth about equally long, obtuse or sub-acute, linear-oblong. Lip much broader than the sepals and petals, margin entire, 5–8 mm. long, 2 mm. wide; at base, on the lateral nerves two lamellae, 1 mm. long. Apical wing of column quadrate, the summit irregularly and minutely crenulate, lateral wings from above the middle of the column.

From Mt. Apo, Mindanao, alt. 5,600 ft., solitary or clustered on mossy trees, April 19, 1904, E. B. Copeland (No. 1025).

Acoridium graciliscapum sp. nov.

Pseudobulbi fusiformes; folia linearia, obtusa; sepala lateralia oblongolanceolata, sub-acuta, 1-nervia; petala lineari-oblonga, obtusa, 1-nervia; labellum oblongum, integrum, bicallosum ad basim; lacinia lateralia apud summam columnam affixa.

Pseudobulbs fusiform, 1.5–2 cm. long, clothed by closely appressed, nigro-punctate sheaths. Leaves linear, tapering at both ends, obtuse, 10–15 cm. long, 5–6 mm. wide, petiolate. Peduncles shorter than the leaves, about 15 cm. long, filiform. Raceme densely flowered, 4.5 cm. long, about 5 mm. through. Bracts broadly ovate, obtuse, about 1 mm. long. Flowers small. Lateral sepals oblong-lanceolate, sub-acute, 2 mm. long, about 1 mm. wide. Petals slightly shorter than the sepals, linear-oblong, obtuse, 1-nerved. Lip oblong, entire, bicallose, 2 mm. long. Column short, stout, apex obscurely 4-lobed or crenulate, lateral arms erect, arising from near the summit of the column, much exceeding the terminal wing.

From the trail to Mt. Apo, Distr. Davao, Mindanao, alt. 5,400 ft., epiphyte in large clumps on mossy trees, April 19, 1904, E. B. Copeland (No. 1019).

Acoridium cucullatum sp. nov.

Pseudobulbi semifusiformes; folia lineari-lanceolata, obtusa; pedunculi quam foliis longiores; sepala lateralia lanceolata, acuta, 1-nervia; petala oblonga, obtusa, 1-nervia; labellum incrassatum, 3-callosum, aliquanto hastatum, obtusum, margine crenulata, callo medio cucullato; laciniae columnae supra medium positae; lacinia media obscure 5–6 dentata.

Pseudobulbs semi-fusiform, 18 mm. long, clothed by closely appressed nigro-punctate sheaths. Leaves linear-lanceolate, obtuse 4.7–9 cm. long, 6–8 mm. wide. Petiole 1.5–3 cm. long. Peduncles slender, longer than the leaves. Flowers in slender, rather densely flowered racemes. Bracts 1.5 mm. long, obtuse. Lateral sepals lanceolate, acute, 1-nerved, 2 mm. long, about 1 mm. wide. Upper sepal oblong, acute, 2 mm. long, 1 mm. wide. Petals oblong, obtuse, 1.5 mm. long, less than 1 mm. wide. Lip fleshy, somewhat hastate, obtuse, 1 mm. long, with ocellate cells along the crenulate margin, 3-nerved at base with a transverse, somewhat cucullate callus, in front of which at each side is a small papilla. Column short, stout, lateral wings above the middle exceeding the middle wing which is shortly and obscurely 5–6 toothed. All of the perianth organs characterized by scattered ocellate cells.

A single unnumbered specimen in Herbarium of the Bureau of Science, Manila. From Mt. Apo, Mindanao, alt. 6,000 ft., on mossy trees, April 21, 1904, E. B. Copeland (marked type).

Acoridium Copelandii sp. nov.

Pseudobulbi oblongi; folia rhombiformi-lanceolata, acuminata, obtusa vel sub-acuta, plurinervulosa; sepala lateralia ovato-lanceolata, acuta, 3-nervia; petala oblonga, acuta; labellum integrum, late lanceolatum, ecallosum; laciniae apud summam columnam; lacinia terminalis 3-lobata.

Pseudobulbs oblong, narrowed above, 33–43 mm. long. Leaves lanceolate, acuminate, obtuse-subacute, many-nerved, 9–17 mm. long, 18–25 mm. wide. Petiole 4–5 cm. long, grooved. Peduncle 8–9 cm. long, shorter than the leaf. Inflorescence an elongated, slender, many-flowered raceme, 5 mm. through, about 10 cm. long. Bracts 3 mm. long, obtuse, longer than the ovary. Flowers about 1 mm. apart. Lateral sepals ovate-lanceolate, acute, 3-nerved, 2.5 mm. long. Upper sepal similar to the laterals. Petals oblong acute, 2 mm. long. Lip entire, broadly lanceolate, obtuse or subacute, ecallose. Column stout, 1.5 mm. long, lateral wings from near the summit, end wing 3-lobed.

A single unnumbered specimen in the Herbarium of the Bureau of Sciences, Manila, from Distr. Zamboanga, Mindanao, E. B. Copeland, 1905 (marked type).

I have not seen *Acoridium bistortum* (Krzl.) Rolfe, but *A. Copelandii* must be closely allied to it according to the figure in Xenia Orchidacea, pl. 299, fig. 1, 1–5, although the inflorescence is very different.

Vol. XIX pp. 155-158 November 12, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NEW PLANTS FROM THE GREAT BASIN.

BY AVEN NELSON AND P. B. KENNEDY.

A desert flora is always interesting to the student. The hard conditions that prevail, produce variation or elimination. The unusual ecological factors give rise to a surprisingly large number of forms that seem to have characters which are both fixed and distinct.

Prof. P. B. Kennedy, of the University of Nevada, Reno, is favorably located for studying just such a flora. The Great Basin has interested others and much is known of its vegetation, but that vast area will long remain a fruitful field of inquiry. Mr. Kennedy is accumulating data and specimens which will add much to our knowledge concerning it. He is kindly permitting the undersigned to study his collections with him. The first paper on the plants of Mt. Rose appeared in the current volume of the Proceedings, p. 35. The present paper is offered as the first of a coordinate series. The results of this season's field work will be offered in subsequent papers.

Sophia paradisa sp. nov.

Winter annual, 1–2 dm. high, branched from the base; stems glandular-pubescent; leaves densely and finely stellate-pubescent, silver-gray, pinnate, 1–3 cm. long; leaflets divided into rounded or linear lobes; flowers light-yellow, minute, clustered at the summit of the fruiting racemes; mature capsules almost glabrous, 4 mm. long and 1.5 mm. wide, abruptly attenuate towards the base and apex; pedicels slightly longer, glandular-pubescent; seeds oblong, light-brown, less than 1 mm. long, glabrous.

Allied to Sophia incisa. Found abundantly on dry, light colored adobe soil in the desert flats of Paradise Valley, Humboldt County, Nevada, April 30, 1905. P. B. Kennedy. No. 1059 (type). A considerable proportion of the specimens seen were stunted by a white rust, *Albugo*.

Sphaerostigma orthocarpa sp. nov.

Plant 1–3 dm. high, branched from the base, hirsute-pubescent throughout; stems several, rather stout, purplish below; lateral branches slender;

leaves variable, from 1–15 cm. long; margins unevenly undulate-dentate; apex acute or obtuse, attenuate to a sessile base; flowers terminating the rather long, bracted, fruiting racemes; calyx-lobes oblong-lanceolate, 4 mm. long; corolla yellowish from the bud, becoming pink and purple with age; petals suborbicular 5 mm. long and 4 mm. wide; capsules narrowly linear, 3–5 cm. long, attenuate at base, straight or slightly curved; seeds 1 mm, long.

Allied to *S. Lemmoni* A. Nels.

Collected on the shore of Pyramid Lake, Washoe County, Nevada, May 19, 1905, No. 1015a (type) P. B. Kennedy.

Godetia latifolia sp. nov.

Whole plant sparsely pubescent; stems purplish, 1–3 dm. high, erect, slender; leaves ovate-lanceolate, acute, entire, the largest 2.5 cm. long, attenuate at the base into a petiole 8 mm. long; calyx-lobes free, broadly linear-lanceolate, 8 mm. long; corolla deep purple; petals 8 mm. long and 6 mm. wide, attenuate at the base; stamens and style of nearly equal length; capsule sparsely pubescent, 8–12 mm. long, attenuate at the apex.

Nearest to G. Tenella from which it is easily separated by the shape and texture of the leaves. Type (accession No. 55,038) collected at Sierra Valley, Sierra County, California, July, 1904, Miss Helen Hamlin.

Oreocarya hispida sp. nov.

Caudex about 5 cm. long, rather slender, apparently biennial; stems several, about 1–1.5 dm. high, floriferous almost to the base; leaves oblanceolate-spatulate, with long petioles dilated at the base, 2.5–5 cm. long including petiole; old leaves pubescent-hispid, silvery-gray; new leaves pilose-hispid, greener; inflorescence thyrsoid-glomerate; pedicels about 3 mm. long; calyx segments 4 mm. long, linear-lanceolate, equaling the tube of the corolla, very densely hispid; corolla cream-colored, tube 3 mm. long, lobes 3 mm. long, orbicular; crests at base of each lobe conspicuous; anthers almost sessile; nutlets forming an ovoid-pyramidal fruit, narrowed above, rather acute, more or less rugose or tuberculated on the back, margins angular; style elongated.

Collected in Carson Valley, Ormsby County, Nevada, April 24, 1904. No. 865 (type). G. H. True.

Cryptanthe densiflora sp. nov.

Root biennial, stout; plant hispid throughout, about 2 dm. high, branching profusely from the base into numerous slender stems; stems thickly clustered with flowers above and below; leaves few, oblong to linear, about 1–2 cm. long; fruiting calyx closed; segments linear-lanceolate, 2.5 mm. long, hispid; corolla 2 mm. long, its lobes 1 mm. long, nutlets 1 or 2, light gray, 1.5 mm. long, minutely scabrous-muricate.

Allied to *C. muriculata* but with smaller nutlets, very slender numerous branches, and profuse inflorescence. Collected at Verdi, Washoe County, Nevada, September 29, 1904, No. 952 (type) P. B. Kennedy.

Cryptanthe nevadensis sp. nov.

Plant about 2 dm. high, branched from the base; leaves few, linear-lanceolate, pilose-hispid, from 1–2 cm. long, usually one at the base of each branchlet; fruiting calyx open, segments with a strong central vein, linear, 5 mm. long, about twice the length of the nutlets, pilose, also beset with stiff bristles; these about 2 mm. long and swollen at the base; corolla white, 2 mm. long; corolla-lobes 1 mm. long with minute brown veins; nutlets 4, and all alike, ovate-acuminate, 2 mm. long, minutely-scabrous.

Allied to *C. geminata* and *C. affinis*. Type (accession No. 55,039) collected in a dry gulch at Reno, Washoe County, Nevada, June 16, 1893. F. H. Hillman.

Cryptanthe Hillmanii sp. nov.

Annual, 1–2 dm. high, very slender, pilose throughout; leaves few, linear, 1–2 cm. long, calyx-segments densely pilose, about 2 mm. long, ovate-lanceolate; flowers mostly in terminal clusters at the ends of the stems and branchlets; corolla minute; nutlets smooth, solitary, scarcely 2 mm. long.

Distinct from any of the species in the section with smooth solitary nutlets, but perhaps nearest to *C. glomeriflora*.

Collected on a rocky hill opposite Huffakers ranch, near Reno, Washoe County, Nevada, May 27, 1893, F. H. Hillman. Type (accession No. 55,220) in Ry. Mt. Herb.

Vol. XIX, pp. 159-172 November 12, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON SOME AMERICAN MOSQUITOES WITH DESCRIPTIONS OF NEW SPECIES.

BY HARRISON G. DYAR AND FREDERICK KNAB.

The following paper is a continuation of the subject presented in this Journal (Proc. Biol. Soc., Wash., xix, 133–142). Continued studies and the receipt of new material have made a number of matters worthy of record. As in our previous paper, the first locality mentioned in the description of new species may be considered the type locality.

Genus ANOPHELES Meigen.

Anopheles quadrimaculatus Say.

Anopheles quadrimaculatus Say, Keating's narr. St. Peters River, ii, 356, 1824.

Anopheles guttulatus Harris, Cat. Ins. Mass., 1833.

Anopheles annulimanus van der Wulp, Tijd. voor Ent., x, 127, 1867.

Anopheles walkeri Theobald, Mon. Culic., i, 199, 1901.

This species is clearly not introduced from Europe, and we think should not be considered the same as the European *maculipennis* Meigen without rigid proof. We are unable to make the comparison, having neither adults nor larvae of the European species. Theobald's comparison of adults (Mon. Culic., i, 194, 1901), is inconclusive, especially without exact examination of larvae. We therefore provisionally eliminate the European names from the synonymy. Our species ranges throughout the eastern United States, from New Hampshire and Ontario to Florida and Texas. We have it also from Cuba. Western localities should be discredited. Occasional specimens have the black wing-spots indistinct or absent. We believe that such specimens were the basis of the records of the European *A. bifurcatus* Linn. in America and of Theobald's *A. walkeri*.

Anopheles occidentalis sp. nov.

Thorax with a broad dorsal pale lilaceous band, cut by three narrow brown stripes; a broad lateral brown band; pleura pale, with three brown stripes; abdomen, legs and palpi dark brown. Wings with the scales of the veins forming four black spots as in *A. quadrimaculatus*, but rather more rounded and contrasted.

118 specimens, Stanford University, California (Isabel McCracken); San Diego, Sissons and Thrall, California (Dyar & Caudell); Portland, Oregon (R. P. Currie); Revelstoke, B. C. (H. G. Dyar); Boise, Idaho (J. M. Aldrich); Lehi, Utah (W. A. Hooker).

Type.—Cat. No. 10,028, U. S. Nat. Mus.

Anopheles atropos sp. nov.

Deep black; thorax obscurely lined with violaceous, especially posteriorly. Head, abdomen and legs black, no markings on the pleurae. Wing scales outstanding, uniform, not forming spots, though a little thicker at the usual points, indicating the spottings.

Allied to *A. quadrimaculatus* Say, but rather smaller, and deep black, not brown, the abdomen without traces of the lighter bandings.

Seven specimens, Florida Keys (Dr. Hiram Byrd).

Type.—Cat. No. 10,029, U. S. Nat. Mus.

Anopheles bellator sp. nov.

Palpi black; head black, a tuft of pale scales between the eyes. Thorax gray, with four black longitudinal lines, the two nearest the middle narrower and stopping short of the base, the two lateral ones attaining the scutellum; before scutellum a short median black line; pleurae dark, with two white stripes. Abdomen entirely dark. Costa of wing with six white spots, one basal, the last at extreme apex; third vein white, with a black spot at apex and near base; fifth vein white near base and at base of the fork, and a small white spot on upper branch; fringe with two white spots, at lower fork of fourth vein and upper fork of fifth vein respectively. Front legs with the femora with a black spot at base, a black dash at middle third and two black spots at apex; tibiae dark above, with two black, nearly encircling, spots at apex; first tarsal joint with a black ring near the base, second and third joints black at the base, fourth and fifth entirely black. Mid legs with the femora mostly black; tibiae black, white at tip; first tarsal joint black, white at tip; second black at base, apical half white; third and fourth joints black, white at tip; fifth black. Hind legs with femora white, black above, with a black ring at the outer third; tibiae black above with two black rings toward apex; first tarsal joint black, with a white apical ring and white at extreme base; second, third and fourth joints black, with white apical ring; fifth joint black.

Three specimens, Trinidad, B. W. I. (F. W. Urich; A. Busck).

Type.—Cat. No. 10,027, U. S. Nat. Mus.

Near *A. lutzii* Cruz, but differs in the coloration of the palpi and legs. According to Dr. Lutz, *A. lutzii* was first described by Dr. Oswald Cruz in the Brazil Medico. Theobald redescribes it as a new species; but it should be credited to Cruz.

Anopheles tarsimaculata Goeldi.

Anopheles tarsi-maculata Goeldi, Os. Mosq. no Para, 133, 1905.

Goeldi proposed this name as a substitute for *albipes* Theobald, because he did not like the name. The specimens before him, from Para, Brazil, are, however, not properly referable to *albipes*, which is synonymous with

albimanus Wiedemann. Neither are they referable to *argyritarsis* Robineau-Desvoidy, of which they are treated as a variety by Goeldi, nor to *albitarsus* Lynch-Arribálzaga, which is another distinct species, as Arribálzaga's figure shows. The form, which is close to *albimanus*, differs in the coloration of the palpi, which have much more of white. Goeldi's name may therefore be used for this form. Our specimens are from Sao Paulo and Manaos, Brazil, and Trinidad, B. W. I.

Genus JANTHINOSOMA Lynch-Arribálzaga.

Janthinosoma vanhalli Dyar & Knab.

Culex albitarsis Neveu-Lemaire (not Theobald), Archiv. de Parasit., vi, 10, 1902.

Janthinosoma vanhalli Dyar & Knab, Proc. Biol. Soc. Wash., xix, 134, 1906.

We quote the above synonymy. *C. albitarsis* Theob. is an African species.

Janthinosoma posticatus Wiedemann.

Culex posticatus Wiedemann, Dipt. Exot. I, 43, 1821.

Janthinosoma echinata Grabham, Can. Ent., xxxviii, 311, 1906.

The form of *Janthinosoma* occurring in Mexico, Central America, Trinidad, Santo Domingo, Jamaica to Brazil, with the hind legs with raised scales, thorax all golden yellow scaled and the abdominal segments below banded with blue-black at base, seems to be uniform throughout its range. It is the *Culex posticatus* of Wiedemann and is a different species from *Janthinosoma sayi* Dyar & Knab (*Culex musicus* Say) of the United States. We have compared larvae of *echinata* received from Dr. Grabham with ones from Mexico collected by the junior author and find them identical. The larvae differs from *sayi* in the much stouter and more heavily-spined antennae, which are about equally long. We have received apparently the same larvae (*posticatus*) from Estero, Florida (J. B. Van Duzee), but they are unbred.

Janthinosoma indoctum sp. nov.

We propose this name for the larvae called "*Janthinosoma scholasticus* Theob." (Journ. N.Y. Ent. Soc., xiv. 182, 1906.) The adults resemble closely those of *J. infine* Dyar & Knab, but differ in the ornamentation of the thorax. In *infine* the thorax is dark reddish brown with two white spots on the disk, two at the front margin, faint, and whitish scales on the scutellum; In *indoctum* the thorax is dull brown with yellowish and white scales forming diffuse patches. *Scholasticus* Theobald is a true *Culex*. All the *indoctum* are from Trinidad; all the *infine* from Santo Domingo. The locality "Trinidad" should be erased in our description of *infine*.

22 specimens, Trinidad (F. W. Urich; A. Busck.)

Type.—Cat. No. 10,026, U. S. Nat. Mus.

Janthinosoma insularius Dyar & Knab.

Janthinosoma insularius Dyar & Knab, Proc. Biol. Soc. Wash., xix, 135 1906.

The larvae of this species are those described and figured by us as "*Janthinosoma pygmaea* Theob." (Journ. N. Y. Ent. Soc., xiv, 182, 1906.)

Janthinosoma pygmaea Theobald.

Grabhamia pygmæa Theobald, Mon. Culic., iii, 245, 1903.
Culex nanus Coquillett, Can. Ent., xxxv, 256, 1903.

We are much indebted to Dr. Grabham for cast skins of the larvae of this species from Jamaica. It falls in our table (Journ. N. Y. Ent. Soc., xiv, 181, 1906) with "*pygmæa*" (*insularius* D. & K.), but differs in detail. In the true *pygmæa* there are four pecten teeth on the tube, which reach nearly to the middle; the teeth are variable in shape, but none have the long secondary spine shown in our figure of *insularius*. The comb scales have the central spine longer and curved at tip. Both the head hairs are single. We have placed the types of *nanus* Coquillett from Florida and a large series taken by Dr. Coffin in the Bahamas with *pygmæa* Theobald from Jamaica. The larvae, however, of these mosquitoes are still unknown.

Genus AEDES Meigen.

Aedes euplocamus Dyar & Knab.

Mr. Urich has sent us from Trinidad, two bred specimens, the larvae of which agree with our *euplocamus* (Journ. N.Y. Ent. Soc., xiv, 199, 1906), described from Costa Rica. The identification of the adult of the Costa Rican larvae as *trivittatus* Coquillett was due to some confusion in the list returned to us; most of the adults are, we find, placed under *confirmatus* in the collection. The name "*confirmatus*" has been used for a number of different mosquitoes which are similar in having a large silvery patch on the anterior part of the thorax. We have given new names to the forms identified as "*confirmatus*" from the United States (*Aedes infirmatus* Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 197, 1906) and Jamaica (*Aedes hemisurus* Dyar & Knab, Journ. N.Y. Ent. Soc., xiv., 199, 1906), and we now identify the Trinidad species, named "*confirmatus*" by Mr. Theobald.

It is, of course, possible that *euplocamus* is the same as *confirmatus* Lynch-Arribálzaga, described from the Argentine, in which case Mr. Theobald's identification should be restored. But we have as yet no proof of this. Our *euplocamus* ranges from Costa Rica to Trinidad, as we now know, and it will doubtless be found to extend into the tropics of Brazil; but whether the Argentine form is the same or not can only be told from more perfect collections than we possess at present.

Aedes serratus Theobald.

Culex serratus Theobald, Mon. Culic., ii, 75, 1901.
(?) *Aedes meridionalis* Dyar & Knab, Journ. N.Y. Ent. Soc., xiv, 195, 1896.

Mr. F. W. Urich has sent us a specimen bred from a small pool in the forest, Trinidad, which we think is the *Culex serratus* of Theobald, described from Brazil and Trinidad. This species has been identified as occurring in the United States, but we have found there to be two species, differing in the larvae. We have renamed these, calling the Atlantic Coast one *Aedes atlanticus*, the Gulf Coast one *Aedes tormentor* (Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 191, 198, 1906). We assumed that neither was conspecific with the Tropical American form, and this assumption is proven to be

correct by the larva before us. It falls in the table with *meridionalis*, having 12 scales in the comb; but differs in that the pecten of the tube does not reach half the length. The difference is not very marked, and the larvae are otherwise much alike, so that it seems not unlikely that our *meridionalis* will fall as a synonym of *serratus* Theobald. Working with the larvae alone and handicapped by the identification of "*Janthinosoma musica* Say" which we had received for the adults (See Journ. N. Y. Ent. Soc., xiv, 195), the larva of the true *serratus* being unknown, we had no way of knowing that we had a larva before us the same as or near *serratus* Theob. A bred adult (♂) of *Aedes meridionalis* shows the median silvery thoracic band of *serratus*, but the specimen is not perfect and we await further material before pronouncing positively on the synonymy.

Aedes pertinax Grabham.

Aedes pertinax Grabham, Can. Ent., xxxviii. 316, 1906.

Dr. Grabham has kindly communicated to us larval skins of this species from Jamaica. It falls in our table (Journ. N. Y. Ent. Soc., xiv, 189, 1906) with *tormentor* Dyar & Knab, from the Gulf coast of the United States, but differs in the pecten of the tube, which does not run out so far, and has the tuft just at the last tooth instead of well within.

Aedes auratus Grabham.

Aedes auratus Grabham, Can. Ent., xxxviii, 313, 1906.

Dr. Grabham has sent us also larval skins of this Jamaican species. It falls in our table (Journ. N. Y. Ent. Soc., xiv, 189, 1906) under dichotomy 5, with *janitor* and *lactator*. These species are *Culices*, and only included under *Aedes* from the similarity of their modification. *Auratus* differs from them in having only the single pair of hair tufts on the tube. These tufts are only just within the pecten, opposite the last tooth. Except for the difference in the lateral comb, the larva is very much like that of *Aedes pertinax* Grabham.

Aedes capricornii Lutz.

Haemagogus capricornii Lutz in Bourroul, Mosq. do Brazil, p. 4 of key to species of Euculicidae, 1904.

Stegoconops capricorni Lutz, Imprensa Medica, (sp. no. x).

Mr. Urich has sent us three males, which we attribute to Dr. Lutz's species *capricornii*. The description applies excellently, except only as to the position of the lower cross-vein of the wings; but as we have only males and Dr. Lutz describes from females, this may easily be a sexual difference if not simply varietal. We are much indebted to Dr. Lutz for copies of the publications above referred to, but are unable to quote the latter one accurately, as the separate sent us contains neither pagination nor date. The "Imprensa Medica" is not available in Washington. *Capricornii* was described from the "zone of the Tropic of Capricorn," which we infer to be the vicinity of Rio de Janeiro, Brazil. The known habitat is now extended to include

the island of Trinidad. Mr. Urich secured the larvae, which are peculiar, with a dense coat of fine long pile. They fall in our table with *philosophicus* (Journ. N. Y. Ent. Soc., xiv, 190, 1906), but differ therefrom in the body pile and the comb of the eighth segment, the scales of which are joined on a basal plate. They occurred in a hollow tree at St. Anns, Trinidad.

Specimens from Trinidad identified by Mr. Coquillett as "*Haemagogus allonaculatus* Theobald" are apparently this species.

Aedes philosophicus Dyar & Knab.

This name (Journ. N. Y. Ent. Soc., xiv, 195, 1906) is based on larvae from Mexico and Salvador, which were identified as adults as "*Haemagogus equinus* Theobald." We refused to accept this name as we could not find the description. It exists, nevertheless (Entomologist, xxxvi, 282, 1903); but the circumstance proves fortunate, for the specimens were wrongly named. *A. philosophicus* has toothed claws in the female adult and obviously belongs to Dr. Lutz's genus *Stegoconops*, which we are unable to recognize as distinct from *Aedes*. The species has faint silvery white bands on all the abdominal segments above and thus superficially resembles *Haemagogus equinus* Theobald, described from Jamaica; but that has simple claws in the female, as Theobald expressly states.

Aedes affirmatus sp. nov.

Shining blue, like *Haemagogus splendens* Williston but the female with the fore and middle tarsal claws toothed. Head and thorax clothed with metallic blue scales, pleurae silvery white; abdomen dark blue above, the first segment with a white bar on each side, below with silvery white segmental bands. Legs blue-black, middle and hind femora with a silvery white spot at tip, the middle femora narrowly white lined below, the posterior ones very broadly so for the basal three-fourths. Base of first submedian cell nearer apex of wing than base of second posterior cell.

Four specimens, Santa Lucrecia, State of Vera Cruz, and Salina Cruz, State of Oaxaca, Mexico; Las Loras, near Puntarenas, and Rio Aranjuez, Puntarenas, Costa Rica (F. Knab).

Type.— Cat. No. 10,023, U. S. Nat. Mus.

The larva is unknown.

Aedes mediovittata Coquillett.

Stegomyia mediovittata Coquillett, Can. Ent., xxxviii, 60, 1906.

Gymnometopa mediovittata Coquillett, Proc. Ent. Soc. Wash., vii, 183, 1906.

Aedes mediovittata Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 196, 1906.

Gymnometopa mediovittata Coquillett, Tech. ser. 11, Dept. Agr., Bureau Ent., 25, 1906.

Mr. Coquillett specified this species as the type of his genus *Gymnometopa*, but later he defines the genus as having simple claws in the female, and includes with *mediovittata*, *scalinata* Theobald, *albonotata* Coquillett and *buscki* Coquillett, species actually with such claws. *Mediovittata*, however, has toothed claws, so that *Gymnometopa* will thus become a synonym of *Aedes*, the other associated species falling into *Haemagogus*.

We have described the very peculiar larvae of this species.

Aedes podographicus sp. nov.

♂. Thoracic ornamentation similar to the ♀. Thorax black, silvery scaled on the sides before the wings. ♀. First joint of middle tarsi white, a black spot at the middle, not black, white at the ends.

This is the Central American form referred to by us as *Aedes insolita* Coquillett under Mr. Coquillett's determination (Journ. N. Y. Ent. Soc. xiv, 203, 1906), but it appears from a nice bred series sent us by Mr. F. W. Urich, that *insolita* (which was described from Trindad) is the female of the species of which *Verrallina laternaria* Coquillett is the male, the sexes being dimorphic. The species will be known as *insolita* Coquillett. In *podographicus* the sexes are monomorphic.

The larvae were separated by us on the shape of the antennae; but as this character is rather indefinite, it will be better to change the table, omitting the dichotomy 40, placing *podographicus* with *insolita* under 44, and separate them by the shape of the pecten of the air tube as shown in our figures 17 and 20, figure 17 representing *insolita* and figure 20, *podographicus*.

Localities as given by us under *Aedes insolita* (*Verralina insolita* Dyar & Knab, not Coquillett). Sonsonate, Salvador may be considered the type locality.

Type.—Cat. No. 10,016, U. S. Nat. Mus.

Genus HAEMAGOGUS Williston.

Haemagogus Williston, Trans. Ent. Soc. Lond., 271, 1896.
Howardina Theobald, Mon. Culic., iii, 287, 1903.
Gualteria Lutz, Imprensa Medica (species No. VI), 1905?
Gymnometopa Coquillett (in part), Proc. Ent. Soc. Wash., vii, 183, 1906.
Cacomyia Coquillett, Tech. ser. 11, Dept. Agr., Bureau Ent., 16, 1906.

The genus *Haemagogus* will have to be recognized on adult characters if at all; the larvae do not sharply differentiate themselves from *Aedes*. We take this to be a group specialized off from *Aedes*, the tarsal claws of the female having lost the tooth. The small end joint of the palpus is retained, which differentiates the genus from *Culex*. We add to the genus, as used by Theobald, *Howardina* and *Gymnometopa* (all but the type species), which differ in ornamentation, but agree in other respects. *Cacomyia* was proposed by Coquillett for *albomaculata* Theobald and *equinus* Theobald, on the venational characters used by Theobald to separate the species. We agree with the English author that these are not of generic value. The other characters adduced by Coquillett from specimens before him are fallaceous, for he had before him neither *albomaculatus* nor *equinus*, the specimens he had so identified being, as to the former, *Aedes capricornii* Lutz and *Aedes affirmatus* Dyar & Knab; as to the latter, *Aedes philosophicus* Dyar & Knab, all with toothed claws, in contradiction of Theobald's explicit statement to the contrary. We presume that the three species placed by Dr. Lutz in his genus *Gualteria* belong here, though we have not seen authentic specimens. *G. fulvithorax* is stated to have simple claws, but of

G. oswaldi and *G. fluviatilis* we can not determine any positive statement in Dr. Lutz's writings on this point. Moreover, the description of *oswaldi* reads so much like our *Aedes insolita* Coquillett that we are in some doubt if it is not actually that species. In this case it would be removed from *Haemagogus*, as *insolita* has toothed claws in the female.

Key to the Species of Haemagogus.

Thorax with narrow longitudinal white or golden lines.
  Two middle thoracic lines running back to scutellum . . . . . [1] *sexlineata* Theobald
  Two middle thoracic lines running back two-thirds, followed by a single line.
    Lateral thoracic line broad, silvery white . [2] *walkeri* Theobald
    Lateral thoracic line narrow, or broken, silvery.
      Median posterior thoracic line narrow, silvery . . . . . [3] *albonotata* Coquillett
      Median posterior thoracic line broad, diffusely golden or silvery, ending in a silver spot on scutellum . . . . . [4] *busckii* Coquillett
  Thorax with a golden lateral line . . . . . [2] *aureostriata* Grabham
Thorax without narrow dorsal lines.
  Base of first submarginal cell nearer base of wing than the base of the second posterior cell.
    Thorax dorsally metallic blue or green.
      Abdomen without spots dorsally . . . . *splendens* Williston
      Abdomen with basal segmental silvery white spots . . . . . *regalis* Dyar & Knab
    Thorax dorsally black and white banded . . *oswaldi* Lutz
    Thorax dorsally golden before, dark behind *fluviatilis* Lutz
    Thorax dorsally all golden . . . . . *fulvithorax* Lutz
  Base of first submarginal cell nearer apex of wing than base of second posterior cell.
    With large setae on third and fourth abdominal segments; last two segments with silvery white median patches . . . . . *albomaculatus* Theobald
    Without prominent setae; fourth to seventh segments with white basal bands . . . . *equinus* Theobald

Haemagogus splendens Williston.

We restore Williston's name for the species identified as the *cyaneus* of Fabricius by Mr. Theobald, as we think we have found a species that fits better to Fabricius' description than *splendens* does, namely *Sabethoides confusus* Theobald.

1. From Trinidad. 2. From Jamaica. 3. From Santo Domingo. 4. From Dominica, Martinique, and Guadeloupe.

Haemagogus regalis sp. nov.

Proboscis long, black; head and thorax brilliant metallic blue and green; pleurae silvery; abdomen dark blue with silvery bands on all the segments above, broader below. Legs blue-black, the mid and hind femora white below towards base. Base of the first submarginal cell slightly nearer the base of wing than base of the second posterior cell.

22 specimens, Sonsonate, Salvador (F. Knab), San Juan, Trinidad (F. W. Urich), Cacao, Trece Aguas, Alta Vera Paz, Guatemala (Schwarz & Barber), Livingstone, Guatemala (H. S. Barber).

Type.—Cat. No. 10,024, U. S. Nat. Mus.

The larva was confused by us with that of *splendens* Williston (*cyaneus* Theobald, not Fabricius). The table (Journ. N. Y. Ent. Soc., xiv, 191, 1906) should be corrected under dichotomy 43 by striking out "short abdominal hairs stellate" and for "*cyaneus*" read "45." Add a new dichotomy, 45, as follows:

45. Pecten reaching over half of tube, of about 18 teeth; secondary abdominal hairs not stellate . . . . . *regalis*
Pecten not reaching half of tube, of about 12 teeth; dorsal abdominal hairs stellate, long . . . . . *splendens*

Haemagogus fulvithorax Lutz.

Haemagogus fulvithorax Lutz in Bourroul, Mosq. do Brasil, p. 4 of Key to Euculicidae, 1904.

Gualteria fulvithorax Lutz in Bourroul, Mosq. do. Brasil, p. 13 of Cat. of species, 1904.

Gualteria fulvithorax Lutz, Imprensa Medica (Sp. No. VII), 1905?

Taeniorhynchus palliatus Coquillett, Can. Ent., xxxviii, 61, 1906.

Mr. Urich has discovered the larva of this elegant species and sent us several larval skins from Trinidad. The species, by the thoracic ornamentation of the adult, is like *Aedes knabi* Coquillett (*Culex knabi* Coquillett, Proc. Ent. Soc. Wash., vii, 133, 1906). That Mr. Coquillett should describe the species in *Taeniorhynchus* while Dr. Lutz places it in *Haemagogus*, shows the futility of the scale characters as a means of generic separation. The larva falls in our table of *Aedes* under the dichotomy 43, and would go into 44 (with *knabi*, *insolita*, and *podographicus*) but that the secondary abdominal hairs are coarse and stellate. It has the air tube short, 2 x 1, strongly tapered on outer half, the pecten of 13 densely placed teeth, the outer ones long, blunt, followed by a long, 4-haired tuft. The larvae were taken from a hollow tree, and were forwarded to Mr. Urich by Dr. J. R. Dickson. We congratulate Mr. Urich and Dr. Dickson on this interesting discovery.

Haemagogus aureostriata Grabham.

Howardina aureostriata Grabham, Can. Ent., xxxviii, 171, 1906.

Dr. Grabham has sent us these curious larvae. They fall in our table in *Aedes*, but separate at the dichotomy 18 on the length of the air tube, it being over four times as long as wide in *aureostriata* and three times or less in the other species. The comb scales are very peculiar, being in a long, straight row, much as in the genus *Mochlostyrax*.

Genus SABETHES Robineau-Desvoidy.

Sabethes cyaneus Fabricius.

Culex cyaneus Fabricius, Syst. Antl., 35, No. 9, 1805.
Sabethes nitidus Theobald, ♀, Mon. Culic., ii, 347, 1901.
Sabethoides confusus Theobald, Mon. Culic., iii, 328, 1903.

An examination of the descriptions of Fabricius and Wiedemann seems to us to clearly indicate that Fabricius had before him this Sabethid, rather than the species *Haemagogus splendens* Williston which Mr. Theobald has made a synonym of Fabricius' old species. The abdominal markings form a lateral line as described, which is not the case in *splendens*, and the color of the thorax also agrees.

Genus WYEOMYIA Theobald.

Wyeomyia pertinans Williston.

Aedes pertinans Williston, Trans. Ent. Soc., Lond., 271, 1896.
Aedes pertinans Giles, Gnats or Mosq., 352, 1900.
Wyeomyia pertinans Theobald, Mon. Culic., ii, 272, 1901.
Wyeomyia pertinans Giles, Gnats or Mosq., 2 ed., 498, 1902.
Aedes pertinans Giles, Gnats or Mosq., 2 ed., 483, 1902.
Wyeomyia pertinans Blanchard, Les Moust., 424, 1905.
Wyeomyia ochrura Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 229, 1906.
Wyeomyia ochrura Dyar & Knab, Proc. Biol. Soc., Wash., xix, 141, 1906.

We quote the above synonymy for this widely distributed species, having now before us cotypes of *pertinans*, which Dr. Williston has very kindly sent us for examination. It is a true Sabethid, not a *Culex* (see remarks under *Culex divisor* Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 222, 1906).

Genus CULEX Linnæus.

Culex ocellatus Theobald.

Culex ocellatus Theobald, Mon. Culic., iii, 222, 1903.

Mr. Urich has discovered the larva of this pretty species, which he had formerly bred from a pupa in Bromelia water. It falls in our table (Journ. N. Y. Ent. Soc., xiv, 207, 1906) with *imitator*, *consolator* and *inimitabilis*, being a close ally of these species, with its extremely long air tube and general slender, colorless appearance. It differs from *rejector* in the smaller pecten with two detached teeth, which are as in *consolator*; it differs from *inimitabilis* in having more teeth in the pecten (it has seven while *inimitabilis* has five) and in having a median hair tuft on the tube instead of a single hair; it differs from *consolator* in having a small multiple tuft on the tube beyond the middle and a subapical single hair instead of four rather long 2-haired tufts. It is nearest to *imitator* Theobald, so much so that we can not demonstrate any differences in the limited and somewhat defective material before us (the head hairs of *imitator* have not been studied). The antennae of *ocellatus* are slender, pale, the tuft from a small notch well beyond the middle; upper head tuft in fours, lower a single thick spinulated hair.

Bred by Mr. Urich from Bromelia water, Sangre Grande, Trinidad.

Culex azymus sp. nov.

♀. Palpi, proboscis and antennae black; head white behind, with a patch of black, forked scales in the middle, black on the sides below, setae black. Thorax black, golden-brown scaled, uniform, without spots, setae black; pleurae whitish, with a black band above bases of legs and another below wings. Abdomen black, with narrow whitish basal segmental bands, widening laterally, venter grayish white. Legs black, the femora pale below, tibiae and the first two tarsal joints appearing whitish on lower side in certain lights, unbanded.

Allied to *Culex pleuristriatus* Theobald, but lacking the thoracic spotting and any trace of the white tarsal bands.

The larva is allied to *pleuristriatus* (Journ. N. Y. Ent. Soc., xiv, 205, 209, 1906), but the pecten of the air tube has two detached teeth, which exceed the two basal hair tufts.

One specimen, bred from larvae in Bromelia water at Arima, Trinidad by Mr. F. W. Urich.

Type.—Cat. No. 10,020, U. S. Nat. Mus.

Culex basilicus sp. nov.

♀. Proboscis black with a broad, dull white ring; antennae and palpi black; head with light golden yellow scales behind. Thorax black with brown-black scales centrally; along the sides of disk a band of light yellow scales with a narrow square central projection into the disk; a square patch of same color behind, and on scutellum; pleurae whitish, marked, with black above, centrally and on the bases of the legs. Abdomen black with central basal white spots on the first four segments, pale terminal hairs on all the segments; venter with short, broad white basal segmentary bands. Legs black, femora pale beneath, tips of femora and tibiae white, tips and bases of the tarsal joints very narrowly white. Wings with narrow scales.

The larva falls in the table with *janitor* and *lactator* (Journ. N. Y. Ent. Soc., xiv, 205, 1906), but differs in having the ring of the anal segment broad; pecten of eight spines reaching to the middle of the air tube; one tuft within the pecten, three beyond it, not in line, two tufts on the dorsal aspect of the tube, all the tufts 2-haired only, thick and coarse.

Five specimens, bred by Mr. Urich from larvae in a tub near the kitchen at Arima, Trinidad.

Type.—Cat. No. 10,021, U. S. Nat. Mus.

Culex consolator sp. nov.

The larva is very close to *Culex rejector* Dyar & Knab, unbred (Journ. N. Y. Ent. Soc., xiv, 221, 1906), found in Bromelia water at Cordoba, Mexico. It differs in having the hair tufts on the tube long, the anal segment with a lateral rosette of spines. A single male was bred by Mr. Urich from a larva in Bromelia water at Arima, Trinidad.

♂. Head black, with narrow, curved whitish-gray scales behind and black setae. Proboscis black, palpi black, very hairy, with white rings at

the bases of the joints; antennae black. Thorax golden brown, with pale longitudinal striation, under a higher power with sparse golden scales and coarse black setae, two whitish dorsal impressed lines and an oblique one on the pleura before the wing insertion. Abdomen black with distinct white basal bands; thorax below greenish; legs black, femora pale below; all the tarsi with narrow white basal rings.

Type.—Cat. No. 10,019, U. S. Nat. Mus.

Culex imitator Theobald.

Culex imitator Theobald, Mon. Culic., iii, 175, 1903.

Culex daumsaturus Dyar & Knab, Journ. N. Y. Ent. Soc. xiv, 220, 1906.

Culex vector Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 220, 1906.

A series of isolations from Mr. Urich indicates the above synonymy. In studying the larvae alone, we had no idea that the larvae with the swelling in the tube could be conspecific with those lacking it (compare our figures 52 and 53), but such seems to be the case. We had before us but one specimen of *vector* and two of *daumasturus*. Mr. Urich has recently sent us four isolations which show a straight tube in two, a barely perceptible indication of a swelling in one and a small swelling in another, placed more basally than in our figure 52. The adults are all alike, and agree with Theobald's description of *imitator* and with specimens from Brazil, which have been kindly sent by Dr. Lutz. Mr. Urich got the larvae in Bromelia water at Arima and Williamsville, Trinidad.

We are pleased to be able to restore Mr. Coquillett's determinations in at least one case (see our remarks, Journ. N. Y. Ent. Soc., xiv, 220 and 221).

Culex lactator Dyar & Knab.

Culex lactator Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 209, 1906 (March).

Culex hassardii Grabham, Can. Ent., xxxviii, 167, 1906 (May).

We have examined larvae and adults sent by Dr. Grabham from Jamaica and find them conspecific with ours from Mexico and Costa Rica.

Culex bastagarius sp. nov.

Very close to *C. mutator*, Dyar & Knab, described from Cordoba, Mexico. The larvae differ slightly. In *mutator* the whole body is densely hairy, the upper head tuft is of three rather long hairs and two of the apical antennal spines are well removed from the tip (Journ. N. Y. Ent. Soc., xiv, pl. x, fig. 42, 1906); in *bastagarius* the thorax only is hairy, the abdomen glabrous, the upper head tuft is of four hairs and very small, the four antennal spines are close together at apex.

The adults of *mutator* were named "*Melanoconion humilis* Theobald" by Mr. Coquillett. *Culex humilis* Theobald (Mon. Culic., ii, 336, 1901), was described from Sao Paulo, Brazil. We have seen neither adults nor larvae from Brazil, and, though Theobald's description, as far as it goes, applies to our specimens, the occurrence of closely allied forms in Mexico and Trinidad, prevent us from accepting the name for the form before us.

C. mutator and *C. bastagarius* are practically identical in markings (and agree with Theobald's description of *humilis*), but in *mutator* the upper

branch of the fifth vein (♂) has the scales narrowly linear and outstanding, while in *bastagarius* they are narrowly obovate, grading into those of the veins above.

One male, bred from larvae in small grassy pools at Laventille, Trinidad, by Mr. F. W. Urich. Two other males are in the collection, bred by Mr. A. Busck from unisolated larvae at Arima, Trinidad.

Type.—Cat. No. 10,018, U. S. Nat. Mus.

Culex carmodyae mollis subsp. nov.

Mr. Urich has sent us a series of isolations bred from larvae in a hollow tree at Sangre Grande, Trinidad. The larvae are so near to those of *Culex carmodyae* Dyar & Knab, described from Santo Domingo (Journ. N. Y. Ent. Soc., xiv, 210, 1906), that we are unable to distinguish them. The adults, however, differ in having very narrow white bands at the bases of the tarsal joints with a few white scales at the apices of the joints also. In both the Santo Domingan *carmodyae* and the Trinidad representative, *mollis*, the hind tibiae have a line of bluish white scales above, the legs being black, the ends of the hind tibiae light brown. In *carmodyae* there is no trace of white tarsal bands, the legs being black, with a scarcely lighter brownish tint at the joints; in *mollis* the bands are very distinct although extremely narrow, hardly wider than the length of a scale.

Six specimens, four males, two females.

Type.—Cat. No. 10,022, U. S. Nat. Mus.

Genus MOCHLOSTYRAX Dyar & Knab.

Mochlostyrax floridanus sp. nov.

The larva falls in the table (Journ. N. Y. Ent. Soc., xiv, 223, 1906), with *pilosus* D. & K., but the body is glabrous. Head broad and squarely transverse, eyes bulging, a large notch at insertion of antennae; clypeus shallowly emarginate with two spines; antennae long, a small notch at outer third bearing the long hair tuft; the two longest of the apical spines placed before apex. Both head hairs single, small, a small third hair below, anteantennal tuft large, multiple. Lateral abdominal hairs in twos on the third to sixth segments. Comb of the eighth segment of 12 scales in a strongly curved, single, rather irregular row. Air tube three and a half times as long as wide, roundly tapered on the posterior side, with a pair of hooks at tip; eight long tufts on the posterior margin in a straight row, two of them within the pecten; two small lateral tufts. Tuft behind the comb large. Anal segment longer than wide, ringed; ventral brush moderate, dorsal tuft few haired. Anal gills rather long, the upper pair considerably shorter than the lower ones.

Larvae from Estero, Florida (J. B. VanDuzee); no adults.

Type.—Cat. No. 10,025, U. S. Nat. Mus.

This may be a synonym of *M. jamaicensis* Grabham (Can. Ent., xxxviii, 318, 1906). Dr. Grabham has kindly sent us larvae and they agree very closely with our *floridanus*. We consider them conspecific. However, Dr. Grabham gives several differential points in his description, and, as whole larvae are sent us, not isolations, there is a chance that a mixture of species occurred.

Mochlostyrax jamaicensis Grabham.

According to the characters given by Dr. Grabham, this species will fall in the table with *pilosus* Dyar & Knab, differing in the relative length of the tube. In *jamaicensis* the tube is "about five times as long as broad (at base)" while in *pilosus* it is four times as long as broad. There are fewer comb scales in *jamaicensis* and they are larger; the anal gills are unequal. Dr. Grabham has kindly sent us some larvae labelled "*Mochlostyrax jamaicensis*" which differ from his diagnosis in having the body glabrous and the air tube three and a half times as long as wide; otherwise they agree well with his description. They are apparently identical with our *M. floridanus*. Still this may be a case of geographically isolated forms, and the adults may be found to possess differences, when known, as in the case of *Culex carmodyae* and *C. mollis*, referred to above, where the larvae are alike and the adults differ, but inhabit separated localities. As it stands, *M. floridanus* will have to be added to the Jamaican list, it being more probable that Dr. Grabham had two species before him than that he should have made any such conspicuous errors in description as these would have to be considered.

Vol. XIX, pp. 173-182 December 8, 1906

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON SOME TORTRICID GENERA WITH DESCRIPTIONS OF NEW AMERICAN SPECIES.

BY AUGUST BUSCK.

The Tortricid moths, placed in European and American catalogues under the generic names *Hemimene* Hübner, (*Dichrorampha* Guenée), and *Lipoptycha* Lederer, form a natural, easily distinguished group, which is at once separated from all other Tortricids (of Europe and America at least) by having veins 6 and 7 in the hind wings remote at base and nearly parallel ; in all the other genera, but two,* these two veins are either approximate, connate or stalked.

The group is an immediate offshoot from the more generalized genus, *Laspeyresia* Hübner (Meyrick & Walsingham) † and the species can from their general habitus alone be confounded with no other genus but that and *Pammene* Hübner, another parallel offshoot from *Laspeyresia*; some of the species of these latter genera are in general appearance very similar to the group under consideration, and others also approach it in having veins 6 and 7 in the hind wings rather distant instead of closely approximate as is normal ; but by consideration of the pterogostic and oral characters combined, there is no difficulty in placing any of the species in its proper group.‡

The two genera *Hemimene* and *Lipoptycha* are by European authors at present separated on Lederer's original character,

* *Isotrias* Meyrick, which belongs to another subfamily and can not be confounded with the present group, and the West Indian and South American genus *Balbis* Walsingham ; I am not acquainted with the type of this genus, *Carpocapsa assumptana* Walker, except through a carefully colored figure of Walker's type specimen, but it appears to be very close to *Hemimene* and must be separated from it by the palpi, which are like those of *Laspeyresia*.

† *Graphotitha* Heinemann, (Rebel) ; *Enarmonia* Hübner, (Fernald).

‡ Thus *maculana* Fernald, described as a *Lipoptycha*, clearly belongs to *Laspeyresia*, near *interstinctana* Clemens ; Professor Fernald was presumably misled by the certainly nearly parallel (still distinctly approximate) veins 6 and 7, but the curved ascending labial palpi with the short brush and short apical joint indicate its proper genus. This genus, placed under the name *Enarmonia*, Hübner, by Professor Fernald (in Dyar's List N. Am. Lep. p. 469, 1903) is *not*, as given in the synonomy, equal *Enarmonia* Meyrick, which is the genus called *Epinotia* by Professor Fernald (*Steganoptycha* Stephens, Rebel).

namely, the presence or absence of the costal fold on the forewings of the males.

This division seems artificial, separating as it does, closely related species as *gruneriana* Herrich-Schaffer, from *alpinana* Treitschke; *saturnana* Guenée, from *simpliciana* Haworth; *kana* Busck, from *banana* Busck, and bringing together species with less affinities as *bugnionana* Duponchel, with *gruneriana* and *plumbana* Scopoli.

The costal fold seems to me, here as elsewhere in the present arrangement of the Tortricidae, to have been given an undue importance and does not appear to be of generic value in the family. The character is like most other secondary sexual characters in the Microlepidoptera, sporadic in its appearance and may be found developed in one species, while wanting in the most closely related species. Thus while certain genera undoubtedly have a general tendency towards the development of the fold and others appear to have no such tendency, the character is not necessarily absolute and the presence or absence of the fold is not necessarily indicative of affinity or the opposite between two species, as little as it proves relation between two genera.*

The gradual modification of this character in the group under consideration from the broad fold, occupying nearly or fully one-half of costa in *agilana* and *plumbagana*—through the narrow fold of *capitana* Busck, hardly reaching one-fourth of the wing length—to the mere trace of a fold, as found in *kana* Busck, also seems but steps towards the total disappearance of the fold in correlated species.

Absolutely no other character is found, separating the two genera, as they are at present defined and for the purpose of a natural grouping of the species, the two genera might better be united, than preserved in their present definition.

But by removing from *Lipoptycha* the species which have other and closer affinities with *Hemimene* and by taking as type for

* Thus I can not believe that genera like *Eucosma*, Hübner, Fernald (*Epiblema*, Meyrick); *Capua* Stephens and authors, and *Archips* Hübner, Fernald (*Cacoecia*, Meyrick) represent natural groups, as they are at present defined; the diversity of the venation found within them, which is far greater than in the group considered in this paper, indicates that they include pickings from a number of genera, which have the costal fold independently developed and which have no close affinities otherwise.

In a subsequent paper, now under way, I shall treat of other groups, which, I think, prove the correctness of this contention still plainer than the present.

Lederer's genus his first species, *bugnionana*, both genera may be retained and a more natural division of the group result.

In *Hemimene* would then be placed the American species hitherto described and the following European species: *plumbana*, *simpliciana*, *saturnana*, *ligulana*, *plumbagana*, *agilana*, *incursana*, *petiverella*, *sequana*, *alpestrana*, *alpinana* and probably most of the other species, at present included in both genera except *bugnionana* and *harpeana*, which together with two American species described in this paper, would make up the genus *Lipoptycha*.*

Thus arranged the two genera may be separated by the following characters:

Hemimene.	*Lipoptycha.*
1 Dorsal part of fore wing below median vein as broad or broader than the costal part above.	1 Dorsal part of fore wing below median vein narrower than the costal part above.
2 Vein 10 in the fore wing rising at least two and one-half times farther from vein 9 than 9 from 8.	2 Vein 10 on the fore wing rising less than two and one-half times as far from vein 9, as 9 from 8.
3 Termen of fore wing less oblique; angle with costa 60 degrees or more.	3 Termen of fore wing oblique; angle with costa less than 60 degrees.
4 Apex of hind wings not protruding beyond anal angle of fore wings.	4 Apex of hind wings protruding beyond anal angle of fore wings.
5 Second joint of labial palpi yellow at base.	5 Second joint of labial palpi not yellow.

The last color difference I certainly do not intend to advocate as a generic character of general value, but it holds good in all the species of the groups under consideration, with which I am acquainted, and I include it as another small but rather significant circumstantial evidence of the propriety of the rearrangement of the species.

All of the above characters may seem trivial, but it should be considered, that the Tortricidae is a remarkably uniform and conservative family, embracing closely allied genera; nearly all characters usually available and important are more or less identically developed in the entire family and any small, constant differences found must therefore be depended upon and

* Some of these are unknown to me except from descriptions and I should not be surprised if some of the other Alpine species shall be found to fall with *harpeana* and *bugnionana*.

are of greater significance than would be the case in more differentiated families.

The following characters are common to the two genera and apply to both sexes: Antennae about ½, simple or with very short ciliation at the tip of each joint; labial palpi moderate, reaching about the length of the head in front of the face, porrected; second joint with large, laterally compressed triangular tuft; terminae joint relatively long, though shorter than second joint, deflexed, parallel with and nearly obscured by the hairs of the tuft; face smooth, head round with the scales meeting on top; eyes large, salient; ocelli large, placed just above the eyes behind the base of the antennae; tongue short, spiraled; maxilary palpi obsolete. Thorax smooth. Fore wing with termen more or less sinuate, sometimes abruptly broken below apex; 12 veins; 1*b* straight, furcate at base; a trace of 1*c* at the edge of the wing; 2 from about ⅔ of cell; 3 from corner of cell; 7, 8 and 9 equidistant at base; 7 to termen; 11 equidistant from 10 and 12; upper internal vein from between 10 and 11 to between 7 and 8 (in *sequana* obsolete); inferior internal vein with upper fork obsolete, lower fork to between 4 and 5.

Hind wings broader than the fore wings; dorsal edge evenly rounded from apex to base; costal edge slightly and evenly rounded; termen sometimes slightly sinuate; 8 veins; 8 connected with cell near base by oblique, sometimes semi-obsolete crossbar; 1*a* and 1*c* present; 1*b* strongly furcate at base; base of median vein hairy; 3 and 4 connate or short-stalked; 5 distant from and parallel with 4; 6 and 7 remote at base and nearly parallel. Male genitalia with uncus rudimentary.

All the species feed in the roots or shoots of Compositae.

Two European species have been placed in the American list namely, *alpinana* Treitschke, and *plumbana* Scopoli, but their occurrence in America seems so highly improbable that I suspect the records must be based on misidentification of closely allied species and I propose to omit them until further evidence is at hand.

The American species at present known may be separated by the following synoptic table:

HEMIMENE.

Fore wings with white dorsal spot	1.
Fore wings without such spot	3.

1. Dorsal spot with narrow dark line through middle . .	2.
Dorsal spot without such line	*capitana*
2. Fore wings with ocherous ocelloid patch	*incanana*
Fore wings without such patch	*britana*
3. Fore wings dark brown without yellow patch	4.
Fore wings not dark brown, or, if so, with yellow markings	5.
4. Fore wings with yellow irroration	*sedatana*
Fore wings without such	*piperana*
5. Fore wings with semicircular yellow dorsal spot	*simulana*
Fore wings without such spot	6.
6. Fore wings with black, undulating, transverse lines . .	7.
Fore wings without such lines	8.
7. Apical part of fore wings purplish	*plummeriana*
Apical part of fore wings not purplish	*leopardana*
8. Fore wings light golden yellow	*bittana*
Fore wings tawny	*radicolana*

Hemimene sedatana sp. nov.

Labial palpi yellow, with apex of brush and terminal joint dark fuscous. Head and thorax dark fuscous. Fore wings in male without fold; termen slightly sinuate, dark brownish fuscous, irrorated with sparse, single yellow scales; costa obscurely ornamented with outwardly oblique, blackish brown streaks, intervened by yellowish white spots, from which very faint bluish-metallic lines run obliquely outwards and then abruptly downwards and inwards; edging the three more prominent of these blue lines below are very thin lines of single, deep black scales; along lower part of termen are four deep black dots. Cilia light, shining fuscous with a dirty white line through the middle. Hind wings dark brownish fuscous; underside with the strong greenish iridescence usual in this group of moths. Abdomen dark brown; anal tuft yellowish.

Alar expanse: 14 mm.

Habitat.—South Park, Colorado (Oslar).

Type.—Male. U. S. Nat. Mus., No. 10,130.

This, I believe, is the species mistaken for *plumbana* Scopoli, which it greatly resembles, but from which it differs by the less profuse irroration of yellow scales and by the presence of the narrow, angulated, deep black lines, following the course of the metallic blue lines.

Hemimene piperana sp. nov.

Labial palpi brownish yellow, with dark brown tips. Head and thorax yellowish brown. Fore wings in male without costal fold; termen nearly straight; dark reddish brown with golden reflections; costa with short, obscure, outwardly oblique, blackish striation, with the intervals lighter than the ground color of the wing; at apical third of the costa is an outwardly oblique, bluish, but hardly metallic, streak to termen below apex and irregular, short, transverse streaks of the same bluish lead color is found sparingly on the apical portion of the wing; at lower part of ter-

men are two or three blackish dots obscurely indicated. Cilia whitish mixed with brown and fuscous. Hind wings whitish fuscous, darker toward the tip; base of cilia still darker. Abdomen dark fuscous; legs ocherous-brown.

Alar expanse: 18 mm.

Habitat.—Pullman, Washington (Piper).

Type.—Male. U. S. Nat. Mus., No. 10,131.

This obscurely marked species is nearest the foregoing and the European *saturnana* Guenée, but is at once distinguished from both by its reddish brown color and the lack of yellow irroration.

Hemimene capitana sp. nov.

Labial palpi yellow, with tip of tuft and apical joint light fuscous. Head and thorax light brown. Fore wings in the males with narrow costal fold, reaching one-fourth of the wing length; termen slightly sinuate; dark fuscous, sparsely irrorated with yellow; on the middle of the dorsal edge is a conspicuous, outwardly oblique, pure white spot, contracted shortly above the edge of the wing and widening out on and above the fold. Costa with obscure, whitish streaks, emitting faint, bluish, metallic, oblique lines, which fade away after passing three or four short, longitudinal, parallel, black lines, just outside of the end of the cell. Four deep black dots on lower part of termen and a few short, transverse, irregular, black lines in the apical part of the wing. Cilia light fuscous, with a central dirty white line. Hind wings light brown. Abdomen fuscous, and brush yellowish.

Alar expanse: 13 mm.

Habitat.—South Park, Colorado (Oslar).

Type.—Male. U. S. Nat. Mus., No. 10,132.

Nearest to the European *petiverella* Linné but rather larger and differing in the form and color of the dorsal patch.

Hemimene britana sp. nov.

Labial palpi yellow, tipped with dark fuscous. Head and thorax dark purplish brown. Fore wings in male with narrow costal fold occupying hardly one-third of the wing length; termen distinctly indented below apex; dark purplish brown, in the apical part strongly irrorated with yellow; on the middle of the dorsal edge is a large, outwardly oblique, triangular, yellowish white spot, reaching up into the cell; through the middle of the spot is a thin, more or less broken, dark line. Costa with narrow, oblique, deep-black striation, edged by yellow scales and intervened by broad, blue metallic lines, which run in broken course through the stroug yellow irroration to tornus. Along termen are four deep black dots. Cilia light shining fuscous, with the darker base followed by a whitish line, which breaks through the base at the dentation of termen and emphasizes this by the color effect. Hind wings bronzy fuscous. Cilia whitish, with a very dark base and an ill-defined dark line before the tip. Abdomen purplish.

Alar expanse: 15–16 mm.

Habitat.—Kaslo, British Columbia (Dyar).

Type.—Male. U. S. Nat. Mus., No. 10,133.

This species was labeled *alpinana* Treitschke, in the Museum collection and is the species recorded as such in Proc. U. S. Nat. Mus., Vol. xxiii, p. 929, but is quite distinct from that species; the European species is smaller, has a darker yellow and differently formed dorsal spot and is strongly suffused with yellow on the entire wing, while *britana* is merely irrorated with yellow on the apical half.

Hemimene incanana Clemens.

Halonota incanana Clemens, Proc. Acad. Nat. Sc., Phil., p. 351, 1860.
Dichrorampha incanana Fernald, Trans. Am. Ent. Soc., Phil., p. 54, 1882.
Hemimene incanana Fernald, Dyar, List N. Am. Lep., No. 5288, 1903.

Palpi white. Head dark gray. Fore wings dark brown, varied with whitish along the inner margin towards the base, with an oblique dorsal white patch, terminating in the ocelloid patch, with a slender, irregular, dark brown line on its middle, and one or two spots on the dorsal edge of the wing. The costa is streaked with white, slightly silvery; beyond the middle of the wing are one or two purplish hued lines, one of which around the ocelloid patch, where it becomes somewhat diffuse. The ocelloid patch is ocherous, with three black streaks and is nearly in the middle of the apical portion of the wing, with a white spot adjoining and beneath it. Hinder border with three or four terminal black spots above the internal angle. Hindwings dark fuscous, grayish towards the base. (Clemens.)

I am unacquainted with this species in nature, but it must be quite close to the foregoing species, *britana*, from which, however, the description differs in several particulars.

Habitat.—Pennsylvania? (Fernald.)

Hemimene simulana Clemens.

Halonata simulana, Clemens, Proc. Acad. Nat. Sc., Phil., p. 351, 1860.
Halonata simulana, Packard, Guide Stud. Ins., p. 337, 1869.
Dichrorampha aurisignana, Zeller, Verh. K. K. Zool.-bot. Gesell. Wien, Vol. XXV, p. 319, 1875.
Dichrorampha simulana, Fernald, Trans. Am. Ent. Soc., Phil., p. 24, 1882.
Hemimene simulana, Fernald, Dyar, List N. Am. Lep., No. 5289, 1903.

Palpi dull ocherous, fuscous at the tip. Head brownish ocherous. Fore wings [in males with costal fold reaching beyond basal third] brown with a slight brassy hue, with an ocherous dorsal blotch, plain in the male and striated with brownish in the female. Costa streaked with ocherous and with two slightly violet-hued streaks from the costa, one running beneath the tip and the other to a faint ocelloid patch, behind which, on the hinder margin, are three black spots. The apical portion of the wing is varied with ocherous. Hind wings fuscous, white on the costa. (Clemens.)

Habitat.—Baltimore, Md.; Easton, Pa. (Clemens).

In U. S. Nat. Mus. are specimens from Anglesea, N. J. (Kearfott); Jeanette, Pa. (Klages), and District of Columbia (Busck).

Allied to *alpinana* Treitschke, but differing in the form of the dorsal spot.

Hemimene bittana sp. nov.

Labial palpi yellow, with tip of brush and terminal joint dark fuscous. Face and head fuscous. Thorax light yellowish brown. Fore wings in

male with costal fold, reaching one-third of the wing length; termen slightly sinuate; basal third of wing light greenish brown, apical two-thirds golden yellow; the darker basal patch is produced in the middle of the wing like an arrow point and is not very sharply limited; at basal third are two short, outwardly oblique, silvery lines from the costal edge; from the middle of costa runs a longer, oblique, silvery line, which bends downwards abruptly and forms the basal edge of a not very conspicuous ocelloid patch, which contains two or three short black dashes and is terminated by a short, perpendicular, silvery line; from apical third of costal edge to a color-indentation below apex is yet another silvery streak. The bases of the apical veins are indicated by thin, deep black, longitudinal lines and along the entire terminal edge is a row of seven or eight deep black dots. Cilia whitish, with base and tip light fuscous. Hind wings purplish fuscous with golden tips; cilia whitish, with dark base. Abdomen dark-purplish fuscous, with lighter anal tuft. Legs ocherous; tarsi faintly annulated with black.

Alar expanse: 15 mm.

Habitat.—Pittsburg, Pa. (Engel).

Type.—Male. U. S. Nat. Mus., No. 10,134.

This brilliant species comes between *simulana* Clemens, and *radicolana* Walsingham, in ornamentation, but is at once distinguished from both by the golden yellow wings.

Named in honor of "Bitten."

Hemimene radicolana Walsingham.

Dichrorampha radicolana Walsingham, Ill. Lep. Het. Br. Mus., IV, p. 75, pl. 77, fig. 10, 1879.

Dichrorampha radicolana Fernald, Trans. Am. Ent. Soc., Phil., p. 55, 1882.

Hemimene radicolana Fernald, Dyar, List N. Am. Lep., No. 5292, 1903.

Palpi tawny, projecting nearly twice the length of the head beyond it, profusely clothed, the apical joint concealed; head tufted above, tawny; antennae the same. Fore wings pale tawny; the costa arched; apex produced; apical margin oblique, indented below the apex; a basal patch, acutely angulated externally beyond the middle of the cell, is shaded within its outer margin with tawny brown, a triangular patch of the same color before the anal angle, the intermediate abbreviated, pale fascia interrupted by waved tawny lines; a tawny brown shade on the apical margin, extended inwards towards the middle of the wing, and a few short, paler brown streaks from the costa. Cilia rather shining yellowish-white, divided in the middle by a tawny line parallel with the apical margin; a fuscous spot on the cilia at the apex. Hind wings brownish fuscous; the cilia yellowish-white, divided by a tawny line (Walsingham).

Alar expanse: 17 mm.

Habitat.—Camp Watson, John Day's River, Oregon.

Food-plant.—*Scrophularia?* (Walsingham).

Type.—Female, in British Museum where I have examined it; no other specimen is known to me at present.

Hemimene leopardana sp. nov.

Labial palpi light yellow, with tip of brush and apical joint black. Face orange yellow; top and sides of head mixed with black. Thorax black with yellow center and patagina. Fore wings in male without fold; termen strongly sinuate and abruptly broken below apex; bright orange yellow, lightest towards the base, deeper, more reddish at apical part; with bold, undulating, and broken, deep-black, transverse lines; costal edge broken by ten nearly equidistant black dashes, from which the cross lines originate; the dashes are intervened by light straw-yellow spaces; from two of these yellow spaces, one on the middle of the wing and one at apical third, runs a short, outwardly oblique, dark blue metallic line; on lower half of termen are three deep black dots. Cilia blackish, with straw-yellow central line, which widens out below apex and breaks through the black base, emphasizing the sinuation there by the color effect. Hind wings rich, dark brown, with a series of orange spots at apex. Cilia whitish with dark tips and deep black base. Underside of both wings dark brown, with strong greenish iridescence and with costal and apical markings corresponding to those on the upperside.

Alar expanse: 9–10 mm.

Habitat.—Hyattsville, Md. (Busck); Pittsburg, Pa. (Engel).

Type.—Male. U. S. Nat. Mus., No. 10,135.

This exquisite little moth can not be mistaken for any of the other described species; it is nearest in pattern and size to the following species, *plummeriana*, but differs greatly in coloration.

Hemimene plummeriana sp. nov.

Labial palpi whitish yellow with black tips. Head and thorax whitish, profusely mixed with black scales. Fore wings in male without costal fold; termen slightly sinuate below apex; wing sharply divided as to color in a basal light greenish-yellow part and an apical dark purplish rust-brown part; dividing these two parts is a nearly straight, bluish-metallic line, which runs obliquely from middle of costal edge to a little before tornus. Basal yellow part is boldly striated by many irregular, somewhat diffused, undulating, black crosslines; on the apical part the black and yellow costal marks are continued as in basal part, but between them originates bluish-metallic lines, one of which, together with a thin black line, runs in undulating course outwards and then abruptly downwards and inwards to tornus; another runs from apical third of costa to termen below apex Just before apex is a deep black, round dot, similar to three dots in a row. along lower end of termen. Hind wings dark purplish-brown, with costal edge whitish, and with a marginal line of golden yellow in the apical part of the wing. Both wings on the underside light fuscous, with strong greenish-metallic reflections and with all the edge-markings of the upperside plainly indicated, even the terminal black dots. Abdomen dark fuscous above, silvery below. Legs silvery, barred and annulated with black.

Alar expanse: 10 mm.

Habitat.—Plummer's Island, Md. (in the Potomac River above Washington City) (Busck).

Type.—Male. U. S. Nat. Mus., No. 10,136.

A striking, oddly ornamented species, very distinct from all other described species. The type was taken at light on an evening in June, when Dr. Wm Dietz and the writer spent the night on the island in pursuit of *Microlepidoptera*.

LIPOPTYCHA.

Fore wings dusted with yellow scales; in males with costal fold . . . . . *kana*, sp. nov.
Fore wings not thus dusted; in males without costal fold . *banana*, sp. nov.

Lipoptycha kana sp. nov.

Labial palpi, head and thorax dark fuscous. Fore wings in male with a short and narrow costal fold with an expansible hairtuft, not reaching one-fifth of wing length; termen with slight sinuation below apex; color uniformly dark shining fuscous, evenly and sparsely irrorated with golden yellow scales; at the lower end of terminal edge are three black dots. Costa without any ornamentation. Cilia whitish fuscous, with darker base and tips. Hind wings dark fuscous; cilia lighter with dark base. Abdomen dark fuscous with yellowish anal brush; legs silvery fuscous; underside of wings with faint greenish iridescence.

Alar expanse: 17–20 mm.

Habitat.—Kaslo, British Columbia (Dyar).

Type.—Male. U. S. Nat. Mus., No. 10,137.

This is the species recorded as *Hemimene plumbana* in Proc. U. S. Nat. Mus., vol. xxvii, p. 929, 1904, but has nothing to do with that species; it closely approaches *bagniomana* Duponchel, in general habitus and color, but is much larger, rather darker, and with sparser yellow irroration, besides possessing the costal fold in the males.

Lipoptycha banana sp. nov.

Labial palpi, head and thorax dark greenish and bronzy fuscous. Fore-wings with no costal fold in the male, termen nearly straight; uniformly dark, shining fuscous, with light brown and blackish scales evenly intermixed, but without any golden irroration; no costal or terminal markings. Cilia whitish fuscous, with darker base and tip. Abdomen dark purplish-fuscous, and brush ocherous: legs unicolored dark fuscous.

Alar expanse: 20–24 mm.

Habitat.—South Park, Colorado (Oslar).

Type.—Male. U. S. Nat. Mus., No. 10,138.

This is by far the largest of all described species of this group; it is similar in form and coloration to the foregoing species and to the European *bagniomana* Duponchel, differing from the former in the absence of yellow irroration on the fore wing and in the absence of the costal fold in the males; from the European species it differs, aside from its size, by the total absence of any defined wing-ornamentation.

Vol. XIX, pp. 183-192 December 8, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON GENERA OF PANICEAE. I.

BY AGNES CHASE.

One of the chief distinguishing characters of this tribe of grasses is the single fruit, composed of the more or less indurated lemma and palea, the latter firmly clasped by the margins of the lemma (rarely loose, as in *Leptocoryphium* and *Hymenachne*), enclosing the free grain. This simple arrangement is variously modified in the different genera. After several years' study of the fruits of this tribe the writer proposes to offer this and subsequent papers on the genera with special reference to the fruits, figuring and describing the fruit of the type species of each genus.

It may be well to state why the character of the fruit is held to have superior generic value. It is because: 1. The character of the fruit is constant in the same species. The first glume may be present or obsolete in *Paspalum distichum* L., *P. Drummondii* Vasey, *P. bifidum* (Bertol.) Nash, and in a few others, not only in the same species but in the same specimen, but within are always the same plano-convex, chartaceous-indurated fruits, the lemma with inrolled margins, the palea included at the apex as well as on the margins; *Reimaria oligostachya* Munro may lack but one instead of both glumes but the fruit remains constant; *Echinochloa crus-galli* (L.) Beauv. may have very long awns or be mucronate only, but the fruit will have the characteristic abruptly acuminate apex, the palea free at the summit. 2. The fruit with but slight modifications is constant for greater or smaller groups of similar species; that is, taking the fruit as a generic character it assembles species which show other resemblances, and does not arbitrarily assemble those which show no close affinity, as does the character of the presence of the first glume in *Paspalum*, which places in *Dimorphostachys*, founded on *Paspalum monostachyum* H. B. K., such diverse species as *P. Drummondii* Vasey and *P. Schaffneri* Fourn., when both have

nearer relatives left in the genus *Paspalum*. The foregoing does not mean that the fruit is held to be the only generic character but merely that it is a strong one which has not received the attention it deserves; while it is held that any generic character must be constant in a species and assemble species having other affinities. Such a character is the reversed position of the spikelets in *Axonopus* Beauv. (*Anastrophus* Schlecht.). The fruits alone would not separate this genus from *Paspalum*, but not one of the many specimens of the several species examined shows a spikelet placed otherwise than with the back of the fruit turned from the rachis.

These studies are based on the material in the National Herbarium where all the genera of this tribe are represented, most of them by a large series of specimens. The figures* and descriptions are drawn from mature or nearly mature fruits; since the spikelets fall at maturity it is difficult to find perfectly ripe fruit in herbarium specimens.

The present paper is confined to that group of Paniceae in which the fruits are cartilaginous-indurated (not rigid) papillose, and usually dark colored; lemmas and paleas alike in texture, the lemmas with more or less prominent, white, hyaline margins not inrolled.

KEY.

Lemma boat-shaped, margin narrow . . . . . *Anthaenantia*
Lemma convex only.
  Palea not inclosed above, lemma hyaline at the summit. *Leptocoryphium*
  Palea inclosed, lemma with broad hyaline margin nearly to the base.
    Fruit lanceolate-acuminate, second glume and sterile lemma clothed with long hairs exceeding the spikelet, grain unequally biconvex . . . . . *Valota*
    Fruit elliptic; second glume and sterile lemma clothed with short hairs or nearly glabrous, grain plano-convex in section.
      Spikelets disposed in 1-sided racemes which are digitate or racemose . . . . . *Syntherisma*
      Spikelets in panicles divergent at maturity . . . . *Leptoloma*

GENUS ANTHAENANTIA Beauv. 1812. Agros. 48. t. 10. f. 7.

Axis paniculatus: Panicula subsimplex.—Glumæ *subæquales*, concave, herbaceae.—FLOSC. INFER. neut.: Paleæ membranaceae, *oppositæ*, *Paleis*

* The figures are all magnified 20 diameters.

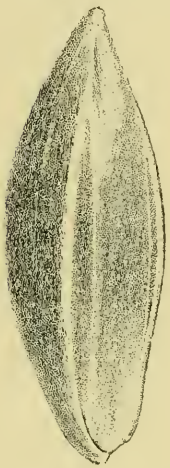
hermaphroditis contrariè *dispositæ*.—Flosc. super. hermaph.: Paleæ *subcartilagineae*.—Spec. Phalaris *villosa* Mich.

Phalaris? villosa Michx. 1803. Fl. Bor. Am. 1: 43. "Hab. in sylvis sabulosis Carolinæ."

Just what is meant by the paleae of the neuter floret placed contrariwise to those of the perfect floret it is difficult to decide. The figure shows such an empty floret consisting of a small lemma and palea placed laterally against the palea of the fruit. Kunth (Rev. Gram. 1: 217) reducing the genus to Panicum with the specific name of *ignoratum*, remarks that "Beauvois who never soaked the spikelets before examining them nor used a needle to open them" mistook the torn margins of the sterile lemma for a 2-valved floret.

Aulaxanthus Ell. 1816. Bot. S. C. & Ga. 1: 102.

"*Flores* paniculati. *Calyx* 2-valvis, 1-floris; valvis æqualibus, sulcatis *Corolla* 2-valvis, subaequalis."



Two species, *A. ciliatus* and *rufus* are described, and "Phalaris villosa? Michx." is given under the first. Though the generic description says the spikelets are 1-flowered, under *ciliatus* is stated: "at the back of the interior valve occurs a neutral floret, 1-valved, ovate, 2-cleft, green."

Aulaxia Nutt. 1818. Gen. 1: 47. Description is nearly identical with that of Elliott, "1-flowered, with the rudiment of a second" added; *Aulaxanthus* is given as synonym; no reason is assigned for changing the name.

These three generic names are founded on the same species.

Description.—Spikelets in narrow panicles, obovoid, first glume obsolete, second glume and sterile lemma subequal, very broad, with 5 strong nerves, the very thin internerves deeply folded and densely clothed with long hairs, the sterile lemma enclosing a small palea and sometimes a staminate flower; fruit as long as the glume, plano-convex, subacute, chestnut brown, the lemma boat-shaped, the 3 nerves visible; the white or pale margins very narrow; palea enfolded its entire length, the 2 nerves visible; grain in section plano-convex.

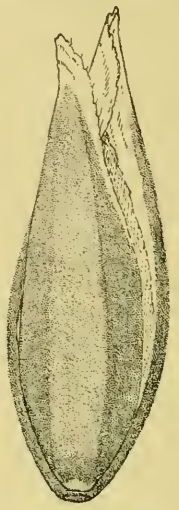
Genus LEPTOCORYPHIUM Nees. 1829. Agros. Bras. 83.

Calyx uniglumis, biflorus, gluma inferiore, deficiente. Flosculus inferior neuter, uniglumis * * * Flosculus superior hermaphoditus, calycis longitudine, in fructu persistens chartaceus (nec induratus), valvulis attenuatis apice membranaceo-hyalinis lacero-ciliatis. [Whence the name from "λεπτός *tenuis* et κορυφὴ *apex*."]

The first species under this genus is *L. lanatum* (H. B. K.) Nees, based on *Paspalum lanatum* H. B. K. 1815. Gen. Pl. et Sp. 1: 94. t. 29. "Crescit in regno Mexicano prope Venta del Cameron et Alto del Peregrino."

Roemer & Schultes (1817. Syst. Veg. 2: 322) transfer this species to *Milium*, in which disposition of it they are followed by Kunth (1829. Rev.

Gram. 497), and Trinius (1834. Mem. Acad. St. Petersb. VI. 3^2 : 121). Bentham (1881. Journ. Linn. Soc. Bot. 19 : 39) transfers it to *Anthaenantia* stating: "From these [N. Am. *Anthaenantia*] I can not separate generically the South American *Leptocoryphium* Nees, which besides some slight specific characters only differs from the North American species in the second glume being constantly, instead of occasionally only, empty." Hemsley (1885. Biol. Cent. Am. Bot. 3 : 483) follows Bentham; Fournier (1881. Mex. Pl. 2 : 13) upholds *Leptocoryphium*.



Description.—Spikelets in narrow panicles, lanceolate; first glume obsolete; second glume and sterile lemma 3 and 5 nerved, the internerves, which are not broad and infolded (or plaited) as in *Anthaenantia*, each with a row of long coarse hairs arising from tubercles (the tubercles sometimes obscure), the second glume shorter than the sterile lemma which equals the fruit and which is empty; fertile lemma slightly cartilaginous-indurated, minutely papillose (the papillae finer than in any of the other genera), chestnut with a white, delicately hyaline, summit, lacerate and often sparingly ciliate, a narrow hyaline margin extending down the sides to about the middle; on the back near the base is a small impressed area thin and white; palea with summit and margins like those of the lemma, not enclosed above, the 2 nerves obscurely visible; grain oblong-elliptic, in section plano-convex.

As shown by the fruit this seems to be, as Nees considered it, most nearly allied to *Valota* (*Trichachne* Nees) from which he separated it chiefly on the absence of the first glume. The inflorescence is like that of *Anthaenantia*, which it resembles also in lacking the first glume, but differs from in lacking the neuter palea or staminate flower and in the convex, not boat-shaped, lemma with a broad hyaline summit. It differs from both *Valota* and *Anthaenantia* in the fruit open at maturity. (A large number of specimens were examined and none in or past bloom were found closed.) Since this species fits so poorly in any other genus it seems wisest to maintain the one Nees established for it. Nees' single other species of *Leptocoryphium* we have not seen.

Genus VALOTA Adans. 1763. Fam. Pl. 2 : 495.

Gramen. Avenae. Sloan. t. 14. f. 2. Couronne de la gaîne des feuilles: Membrane médiocre. Fleurs: Panicule étagée. Calice: Ovoide, sans arêtes, à 3 bales velues. Corolle: Sans arêtes.

The reference to Sloane serves to identify the genus, which the very insufficient description would not do, and fixes its identity with *Andropogon insulare* L.

Andropogon insulare L. 1759. Pugill. Jam. 30; and Sp. Pl. Ed. 2. 1763. 2 : 1480. In the Pugillus no citation is given; in the Species Plantarum

the previous publication by Linnaeus is cited, and also Brown Jam. 365, and Sloane, 1 : 43. t. 14. f. 2. "Hab. in Jamaica."

Brown (l. c.) after his polynomial cites Sloane t. 14.

Sloane's figure (l. c.) is an excellent representation of the upper portion of the plant, a leaf and overmature panicle.

Panicum lanatum Rottb. 1776. Descr. Pl. 3. Based on *Andropogon insulare* L.; the same reference to Sloane is also given. Here follows the first adequate description of the species, even the fruit being described: "*Corollæ valvæ* 2 lanceolatæ, concavæ, acutissimæ, membranaceæ."

Milium villosum Sw. 1788. Prod. 24. Based on *Andropogon insulare* L.

Beauvois 1812. Agros. 150, in the index refers *Andropogon insularis* to *Monachne*, but this species is not mentioned under that genus on p. 49.

Panicum leucophoeum H. B. K. 1815. Nov. Gen. et Sp. 1 : 97. Based on *Andropogon insulare* L. This species and *P. adscendens* H. B. K., which is *Syntherisma sanguinalis* or a close ally, are placed together under "3) Spicis verticillatis, fasciculatis aut paniculatis (Digitariæ plurimæ)."

Panicum insulare Meyer. 1818. Prim. Fl. Esseq. 60. Based on *Andropogon insulare* L. The "valves of the corolla" are given as coriaceous with membranaceous margins.

Acicarpa Raddi. 1823. Agros. Bras. 31. with one species *A. sacchariflora* Raddi l. c. t. 1. f. 4. This is given on the authority of Nees. We have not seen the original publication.

Trichachne Nees. 1829. Agros. Bras. 85.

(a θρίξ *capillus* et ἄχνη *gluma*.)

Calyx bivalvis, subbiflorus, gluma inferiore minuta. Flosculus inferior univalvis vel bivalvis hirsutus, neuter; superior hermaphroditus, valvulis membranaceis mucronatis Caryopsis flosculi valvulis membranaceis vestita * * * Inflorescentia: racemi elongati, simplices, unilaterales, verticillatim paniculati. Spiculae geminae ternaeve, altera brevius pedicellata. * * * Flosculus hermaphroditus * * * bivalvis, glaber, membranaceus, valvulis lanceolatis in mucronum subulatum attenuatis ad fructum persistentibus membranaceo-chartaceis caryopsin tegentibus neque cum eadem induratis. * * * Differt a Panico praesertim gluma flosculi hermaphroditi, * * * at minime crustaceo seu cartilagineo indurato sed semper flexili.

Acicarpa Raddi 1823. Agros. Bras. 31. t. 1. f. 4. is cited as synonym and a note of explanation added that the name is expunged because of its similarity to *Acicarpha* Juss. [1803]. Nees' first species is *Trichachne insularis* (L.) Nees, based on *Andropogon insulare* L. Five other species are included, *T. sacchariflora* (Raddi) Nees, and four new species from Brazil, *T. recalva*, *tenuis*, *velutina*, and *ferruginea*, the last two of which Nees says he saw in the Royal herbarium at Berlin.

Grisebach (1864. Fl. Br. W. I. 557) places *Panicum insulare* and *P. saccharatum* Buckl. in *Tricholaena*; Stapf (1898, in Fl. Cap. 7 : 382) transfers "*Panicum leucophaea* Sw." to *Digitaria*, remarking, "the structure of the spikelets is * * * as in *Digitaria*." Stapf probably means *P. leucophoeum* H. B. K., which is a typonym of *A. insulare* L. Swartz did not publish the name given by Stapf. Millspaugh and Chase (1903, Fl. Yucatan,

Field Col. Mus. Bot. 3 : 23) transfer *T. insularis* to *Syntherisma*, remarking: "That this species belongs in the genus *Syntherisma* rather than in *Panicum* is shown chiefly by the fruiting glumes which are of the form characteristic of the former, having a floral glume with hyaline margins not inrolled."

Description.—Spikelets in pairs, short-pediceled in 2 rows along one side of a narrow rachis, the slender racemes erect or nearly so, solitary or fascicled along a common axis forming a narrow panicle; spikelets lanceolate, first glume minute, glabrous, the second and sterile lemma usually as long as the fruit or longer, 3–5 nerved, copiously clothed with long silky hairs (in one species, only, the silky hairs are not long and dense); fruit lanceolate, usually brown, the flat, white, hyaline margins broad; grain ellipsoid, in section unequally biconvex.

This genus is very closely allied to *Syntherisma* Walt. One species, *Panicum Pittieri* Hack., has the inflorescence of *Valota*, but the hairs on the second glume and sterile lemma are not long and copious, and the second glume is shorter than the fertile lemma as in some *Syntherismas*. But considering the diverse aspect of the two genera as a whole it seems wisest to regard them as distinct.

The following species are transferred to this genus:

Valota insularis (L.)

Andropogon insulare L. 1859. Pugill. Jam. 30.

Valota saccharatum (Buckl.)

Panicum lachnanthum Torr. 1856. Pac. Rail. Rep. 7 [3] : 21, not Hochst. 1855.

Panicum saccharatum Buckl. 1866. Prel. Rep. Geol. & Agr. Surv. Tex. App. 2. "Middle Texas."

Trichachne saccharatum (Buckl.) Nash. 1903 in Small Fl. So. U. S. 83.

Valota Pittieri (Hack.)

Panicum Pittieri Hack. 1901. Oest. Bot. Zeitsc. 51 : 367. "Costarica: in ripa rivi Rio Tirili prope San José leg. Tonduz: Pittier distribuit sub nro. 6945."

The species represented in American herbaria by Nealley's Texas collections and passing under the name *Panicum tenerrimum* Kunth, (based on *Trichachne tenuis* Nees) does not well agree with Nees' description. Since authentic specimens of this and Nees' other Brazilian species have not yet been seen, his species and the Texas form are left for future study; and to avoid the possibility of making unnecessary combinations by taking up possible synonyms these species and an Australian one with stramineous fruits are not here transferred to this genus.

Genus SYNTHERISMA Walt. 1788. Fl. Carol. 76.

Digitaria Haller 1768. Stirp. Helv. 2 : 244 not Adans. 1763, nor Heist. 1759, though Haller gives Heister and Adanson as authors of his *Digitaria*; but his description, though he evidently makes an effort to harmonize it

with those of Heister and Adanson by emphasizing the "excavations" of the rachis, applies not to *Tripsacum* but to the grasses so long known as *Digitaria*, and his pre-Linnaean references lead to *P. sanguinale* L.

Antiquum nomen, & characteristicum, reddo plantis nostris, quæ adeo vehementer a Linnæus *Panicis* abludunt, ut nullo modo eo referri possint. Receptaculum Tritici, alternis scrobibus excavatum. Ad eas scrobes applicantur flosculi petiolati. Calyx biglumis, lineatus, altera gluma parva, mucronata, altera majori faciei floris respondente, lineata: ita mucronata, compressa, ovato lanceolata uniflora, locusta oritur. Flos durus, nitens, siccus, convexus inde, hinc complanatus, & linea quasi divisus, non tamen penetrante. Nonquam satis potui distinguere divisionem in duas glumas. In cavea certe undique clausa semen sedet, compressum, planum.

Under his first species, to which Haller, who evidently opposed such an innovation as a binomial system, applies a polynomial, "Linn. p. 84" is cited, with Linnaeus' description of *P. sanguinale* used as a polynomial, the name *sanguinale* being omitted. The reference is to the 1762 edition of Species Plantarum. For discussion of *Digitaria* Heister see Hitchcock, Bot. Gaz. 38 : 298, and Nash, Bul. Torr. Bot. Club 25 : 289.

Panicum sanguinale L. 1753. Sp. Pl. 57. "Spicis aggregatis, basi interiore nodosis, flosculis geminis muticis, vaginis foliorum punctatis. * * * Habitat in America, Europe australi."

The specimen under this name in the Linnaean herbarium is the traditional *P. sanguinale* fide Prof. A. S. Hitchcock who has seen it. The first reference after the description is to Royen Fl. Leyden 55, where, after the polynomial quoted by Linnaeus, Sloan. Hist. 1 : 113, t. 70, f. 3 is cited. The second reference is to Gron. Virg. 154 [error for 134]. Gronovius refers to *Clayton* n. 457. Linnaeus' reference (Sp. Pl. 57) to Sloane 1 : 113 t. 70 f. 2 is evidently an error. The polynomial and figure cited in Royen applies to *P. sanguinale*.

Syntherisma Walt. 1788. Fl. Carol. 76.

Cal. 1-florus, 2-valvis: valvulis planis, acutis interiore minore recta, exteriore lateribus corollam subamplexante. *Cor.* 2-valvis: valvulis magnitudine et figura valvulae majori calycis simillimis. * * * Semen unicum, calyce corollaque persistentibus vestitum.

The first species is *S. præcox* Walt. "No specimen in [Walter's] herbarium. There is not much doubt but this refers to *Panicum sanguinale* L. (*Digitaria sanguinalis*), as stated by Elliott and Michaux." Hitchcock, Sixteenth Ann. Rept. Mo. Bot. Gard. 44.

Michaux (1803. Fl. Bor. Am. 1 : 45) includes *Syntherisma praecox* Walt. as synonym under *Digitaria sanguinalis* Scop.

This group has been held to be a genus or reduced to a section of *Panicum* according, seemingly, to the weight given its form of inflorescence. Nees, while noting the less indurated and "always pliable" lemma of *Trichachne*, does not seem to have noted that the same is true of the group he placed as section *Digitariae* of *Panicum*, nor that the differences from *Panicum* which he points out for *Trichachne* do not separate that genus from his section *Digitariae*. The form of inflorescence does not clearly distinguish this genus from *Panicum*, since the species known as *Panicum Perrotteti*

Kunth (*Paspalum Perrotteti* Hook f.) and its close allies have sparingly branched racemes more or less naked at the base forming a panicle not greatly unlike that of *Panicum proliferum* and yet are true *Syntherismas* as shown by the spikelets and especially by the cartilaginous-papillose lemma with flat, hyaline margins. Hooker f. (1896 Fl. Br. Ind. 7 : 10) places these and other species of Section Digitaria in Paspalum, saying "As above defined, *Paspalum* includes the Digitaria section of Panicum, which appears to me to be artificially placed in the latter genus, because of the occasional presence of a very minute scale-like glume at the base of what is the 3rd gl. of Panicum (that opposite the flg.). This minute glume which is present or absent even in the same species, is nerveless and never embraces that above it, as the lowest glume always does* in *Panicum* proper." The first glume is not only present or absent in the same species in *Syntherisma*, but sometimes in the same specimens, as in those of *P. Perrotteti* in the National Herbarium. Nash (Bul. Torr. Bot. Club 25 : 289) while contending that *Syntherisma* is as worthy of generic rank as are *Paspalum*, *Anthaenantia*, *Eriochloa*, *Isachne*, *Ichnanthus*, and *Trichoiaena* fails to point out why it is so, and adds: "Our own view is that *Syntherisma* is more nearly related to *Paspalum* than to *Panicum*, and if its union with either genus were desirable it would certainly be with the former and not with the latter." If the cartilaginous-papillose lemma with flat hyaline margins be taken for the chief generic character, *Syntherisma* is at once clearly distinguished from both *Panicum* and *Paspalum*, with no intermediate species.

Description.—Spikelets solitary or in 2's or 3's, subsessile or short-pediceled, alternate in 2 rows on one side of a 3-angled winged or wingless rachis, the slender racemes usually more or less spreading, usually digitate or in approximate fascicles at the summit of the culm, rarely distributed along the axis; spikelets lanceolate or elliptic; first glume minute or wanting, the second glume equalling the sterile lemma or shorter, fruit lanceolate or elliptic, the flat, hyaline margins white or pale; grain subelliptic, in section plano-convex or slightly concavo-convex.

The affinities of *Syntherisma* are with *Valota* on the one hand and *Anthaenantia* on the other. To the former it is allied through *V. Pittieri* and the species mentioned above as "*Panicum tenerrimum*" from Texas. *Syntherisma* approaches *Anthaenantia* through *Panicum* (§ *Digitaria*) *adustum* Nees and *Anthaenantia Hackeli* Arech. allied species, and *Panicum badium* Scribn. & Merr., which are placed in *Syntherisma* rather than in *Anthaenantia* on the following characters: Spikelets in pairs in 2 rows along one side of a triangular rachis; a minute first glume present (though this has little weight); second glume not equalling the sterile lemma (which is empty or contains only a nerveless rudiment of a palea), neither of them broad with deeply folded internerves as in *Anthaenantia*; lemma not boat-shaped, the hyaline margins broad. In addition to the species con-

* Hooker was probably not acquainted with the Dichotomous Paniceums in which he first glume is often nerveless and seldom embraces the second.

sidered by Nash (l. c.) in his treatment of the genus the following are here transferred:

Syntherisma adusta (Nees)

Panicum adustum Nees. 1829. Agros. Bras. 101. "Habitat in Brasilia meridionali. (Sellow.)"

Syntherisma badia (Scribn. & Merr.)

Panicum (*Syntherisma*) *badium* Scribn. & Merr. 1901. U. S. Dept. Agr. Div. Agros. Bul. 24 : 12. "Sierra de San Felipe, State of Oaxaca" 915 C. L. Smith.

Syntherisma Hackeli (Arech.)

Anthaenantia Hackeli Arech. 1894. Anal. Mus. Nac. Montevideo 2 : 96, t. 5. *Figueira*, Uruguay.

Syntherisma velutina (DC.)

Milium velutinum DC. 1813. Cat. Hort. Monsp. 126. "Hab. in Mexico."

Paspalum? velutinum Kth. 1829. Rev. Gram. 1 : 27.

Represented by *Pringle 6623* and *9565*.

Syntherisma Perrotteti (Kth.)

Panicum Perrotteti Kth. 1829. Rev. Gram. 2 : 395. t. 3. "Crescit in Senegalia, prope Walo."

Syntherisma stenotaphroides (Nees)

Panicum (*? Digitaria*) *stenotaphroides* Nees 1854 in Steud. Syn. Pl. Glum. 1 : 41. "Ins. Choin legit Cuming."

This and an allied species are peculiar in having a thickened rachis, the solitary spikelets sunken in the alternate notches.

Species as yet imperfectly understood are not here transferred.

Genus LEPTOLOMA gen. nov.

Inflorescentia paniculata, panicula pauciflora, maturitate diffusa; spiculae 1-florae, fusiformae, solitariae, aut raro per paria, in pedicellis tenuibus triangularibus; gluma prima minuta aut deficiens, secunda 3-nervis; lemma neutrum 5–7 nerve; fructus ellipticus, acutus; lemma hermaphroditum cartilagineo-induratum, papillosum, marginibus delicatus hyalinas, planis; palea similis; caryopsis oblongo-elliptica lemmate paleaque inclusa, libera. Gramina perennia, caespitosa, ramosa, culmis fragilibus, laminis planis, ligulis membranaceis. Maturitate paniculae se dissipant et pervolvunt Panico capillari similes. Nomen ab λεπτός *delicatus* et λῶμα *margo*.

Inflorescence a few-flowered panicle diffuse at maturity; spikelets 1-flowered, fusiform, solitary or rarely in 2's on slender triangular pedicels; first glume minute or obsolete, the second 3-nerved, nearly as long as the 5–7 nerved sterile lemma, a more or less prominent stripe of appressed silky hairs down the internodes and margins of each; sterile lemma empty or enclosing a minute nerveless rudimentary palae; fruit elliptic, acute, brown; fertile lemma cartilaginous-indurated papillose, with delicate hyaline flat margins, enclosing a palea of the same texture: styles long and delicate, stigmas plumose, the branches more long and slender than in *Panicum*, rather less so than in *Syntherisma*; grain oblong-elliptic, in section plano-convex; free within the closed lemma and palea. Tufted branching perennials with brittle culms, flat blades,

and membranaceous ligules. At maturity the panicles break away and roll like tumble-weeds. Name from λεπτός *delicate* and λῶμα *border* in reference to the hyaline margins of the fertile lemma.

Type.—Panicum cognatum Schultes.

Leptoloma cognata (Schultes.)

Panicum divergens Muhl. in Ell. 1816. Sk. Bot. 1 : 130. not H. B. K. 1815. Specimen in Elliott herbarium in College of Charleston.

Elliott gives "Muhl. Cat." without page as authority for this name; in Muhl. Cat. 9 (1813) *divergens* is a nomen nudum.

Panicum divergens Muhl. 1817. Gram. 120. "Habitat in Carolina." Specimen in the Muhlenberg herbarium in Philadelphia Academy of Natural Sciences, marked "Elliott 353." In the same folio with this is a specimen of *Panicum Philadelphicum* marked "M. 112b."

Panicum cognatum Schultes 1824. Mant. 2 : 235. Muhlenberg's description is copied and *P. divergens* Muhl. is cited as synonym, the name changed, doubtless, because of *P. divergens* H. B. K., though this older use of the name is not mentioned. Thus it is the second publication of *P. divergens* Muhl. (that in Muhl. Gram.) on which Schultes bases his *P. cognatum*. Hence the specimen in Muhlenberg's herbarium is the type.

Panicum autumnale Bosc. Spreng. 1825. Syst. 1 : 320.

This name as used by American authors is synonymous with above, but we have not seen Bosc's specimen. Sprengel (l. c.) places the description of *P. autumnale* next to that of *P. divergens* Muhl. The brief description would apply to any *Panicum* with an effuse capillary panicle. It was not known to Sprengel where the specimen came from; "Patria?" he adds to his description, and indicates he saw the specimen in the Willdenow herbarium.

The sheaths and blades of this species, especially the lower ones, are often papillose pubescent, commonly so in Western specimens, though the type is almost glabrous. *Pringle 489*, Chihuahua, Mexico, represents an extreme form with slightly larger spikelets, having densely silky-pubescent internerves, which would appear to be a distinct species except for the fact that the inter-grades are more numerous than the extreme form. This is the only species of this genus known in the northern hemisphere. Three or four species are found in Australia.

Leptoloma divaricatissima (R. Br.)

Panicum divaricatissimum R. Br. 1810. Prod. 192. Port Jackson, New Holland.

Leptoloma macratenium (Benth.)

Panicum macratenium Benth. 1878. Fl. Australia 7 : 468. "Queensland, Rockhampton, *O'Shanesy*."

Leptoloma coenicola (F. Muell.)

Panicum coenicolum F. Muell. 1855 in Trans. Vict. Inst. 45. Cudnaka, S. Australia, *F. Mueller*.

Panicum papposum R. Br. Prod. 192, and *P. nematostachyum* Bailey 1903 in Bot. Bul. Dept. Agr. Queensl. 16 : 2, of which we have not seen specimens, probably belong here. The former is *P. autumnale* F. Muell. Fragm. 8 : 196, not Bosc, fide Bentham Fl. Australia 7 : 469.

Vol. XIX, pp. 193-198 December 31, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

WEST AMERICAN MITRIDÆ—NORTH OF CAPE ST. LUCAS, LOWER CALIFORNIA.

BY MRS. M. BURTON WILLIAMSON.

As the nomenclature of our West Coast Mitras appears to be somewhat confusing, it has been thought advisable to review some of the literature upon this subject and also to give excerpts from letters written upon the synonomy by well known authorities. As indicated by the title this paper does not include Gulf species—nor are fossil forms included unless represented by recent shells.

The writer desires to acknowledge her obligation to Dr. William Healey Dall and Dr. Paul Bartsch, of the U. S. National Museum, Prof. James Cosmo Melvill, of Shrewsbury, England, Mr. Edgar A. Smith, British Museum, Sowerby and Fulton, London, England, Dr. R. E. C. Stearns, Mr. Henry Hemphill and Fred L. Button, Esq., of California, for courtesies received from them. She is especially indebted to the British Conchologists for original descriptions of *Mitra idæ* Melv., *M. fultoni* E. A. S, and a very fine, typical example of *M. orientalis* Gray =*M. maura* Swains.

Family MITRIDÆ.

Mitra episcopalis Lam, the type of this Mitriform family, ranks high among showy shells but the West Coast representatives are noted for their somber aspect.

Of the relationship of this family, Dr. William Healey Dall says: "While I have no doubt in my own mind that Voluta, Scaphella, Turbinella, Fasciolaria, Mitra and the Fusidæ all proceeded from one stock and could not be separated as families in the Eocene time, yet that does not exclude the recognition of the divergencies which have been brought about at the present epoch, by gradual evolution from more compact original groups.*

* Trans. Wagner Free Ins. Sci., Phila., Vol. III, 1820, p. 92.

WEST COAST MITRAS, NAT. SIZE.

Figs. 1 and 2. *Mitra idæ*, young. San Pedro, California.

Figs. 3 and 4. *Mitra idæ*, adult. San Pedro, California. Epidermis partly removed. No. 4 collected by Mrs. E. A. Lawrence.

Fig. 5. *Mitra idæ*, adult. San Pedro, California. Epidermis wholly gone, color of shell light brown. Collected by Mr. Delos Arnold.

Fig. 6. *Mitra fultoni* E. A. S. Pt. Abreojos, Lower California. Collected by Mr. Henry Hemphill.

Fig. 7. *Mitra orientalis*. Peru.

GENUS MITRA LAM.

Mitra—typical—is mitriform, thick, with spire elevated, sharp apex, aperture narrow with a notch in front; "columella obliquely plicate; lip rather thick, smooth within." The animal is described as having in general a short foot, siphon somewhat short, proboscis cylindrical, eyes on tapering tentacles, the latter close together on a long and flat head; color white. The dentition of the group is an important factor.

Mitra idæ Melvill.

Mitra idæ Melv., Description of a New Species of Mitra, The Conchologist, Vol. II, part 6, p. 140, pl. 1, fig. 6, 1893; Sowerby and Fulton's Catalogues of Recent Mollusca.

Mitra maura Swainson *non* Carpenter Report Brit. Asso. Ad. Sci. for 1856, London, 1857: Report B. A. A. S., 1863, pub. 1864; Cooper,* Geographical Cat. Moll., 1867; Tryon Man. Conch., Vol. IV, p. 121, 1882; Orcutt, Proc. U. S. Nat. Mus., p. 336, 1885; Cooper, Seventh An. Report State (Calif.) Min., p. 251, 1887, pub. 1888; Keep, West Coast Shells, p. 42, 1887; Bowers,† Ninth An. Report State (Calif.) Min., p. 58, 1889, pub. 1890; Hemphill, Cat. N. Amer. Shells, p. 2, 1890; Yates, Bull. Santa Barbara Soc. Nat. Hist., p. 44, 1890; Williamson, Proc. U. S. Nat. Mus., Vol. XV, p. 211, 1892; Kelsey, The Nautilus, Vol. XII, p. 89, 1892; Arnold, Mem. Cal. Acad. Sciences, p. 222, 1903; Keep, West Am. Shells, p. 166, 1904; Arnold, The Tertiary and Quaternary Pectens of California (P. P. No. 7, U. S. Geological Survey), p. 36, 1906; Williamson, Some W. American Shells,—Including a New Var. of *Corbula luteola*, etc. (Bull. S. California Acad. Sciences) p. 123, 1905.

It is evident from the synonymy that the West Coast shell commonly called *Mitra maura* Swains. was presumed to be like the one from Peru described by Swainson (Proc. Zool. Soc. 1835). When Miss Ida Shephard —Mrs. Oldroyd—(for whom the shell was named), sent the California shell as *M. maura*, Mr. Fulton, on comparing it with those in the British Museum from Peru, detected the difference and invited Prof. James Cosmo Melvill, M. A., F. L. S., who had described something like 40 species of Mitras, to describe it. The specimen was from Point Loma, California, length, 2.25 in., diam. .75 inch.

In his description Prof. Melvill says: "This interesting species belongs to a section of the genus which has its headquarters on the western shores of North America and Mexico, of which *Mitra lens* (Wood) may be taken as the type, all the species possessing a black or dark-brown epidermis, and being more or less decussate or puncto-striate, and it is not unlike the recently described *M. fultoni* (E. A. Smith) from the same locality. Differentiation, however, seems easy between them." (Des. of a New Species of Mitra by James Cosmo Melvill, M. A., F. L. S.)

Specimens of Mitras from San Pedro and San Diego, that were locally known as *M. maura*, were submitted to Professor Melvill by the writer, and he unhesitatingly pronounced the larger ones the same as the type specimen, in his possession, of *M. idæ*. Young specimens of *M. idæ* are lighter brown in color and smooth, although occasionally one is found which shows the liræ.‡ Of the shells submitted ⁂ he wrote that they dif-

* In Cat. W. N. Amer. and Foreign Shells, with Geog. Ranges and Labels, etc., by J. G. Cooper (State Min. Bu. Spr. 1894), *Mitra maura* is listed as "Sowerby's" instead of "Swainson's," evidently a misprint as Dr. Cooper cites the authority correctly elsewhere.

† Mitra maura Rve. (?)" evidently a misprint.

‡ Prof. F. W. Kelsey has kindly given the writer the following measurements of young Mitras: "The two best young specimens I have measure 7x17 mm. Ratio 2.43. The adult *M. maura* 21x68 mm. Ratio 3.24, and 18x58 = 3.22, while the *M. fultoni* are in same ratio. The juv. specimens, therefore, you notice are far from same proportions as the adult, although having all the markings and coloring of (*idæ*) *maura*."

⁂ See figures on page 194.

fered in toto from what he had "always called *M. orientalis* Gray,=*M. maura* Swains. from Peru and Chilian Coasts." That species called *M. chilensis* by L. C. Kiener is admirably figured under the latter name by Kiener Coq. Viv., Mitra, tab. 10, figs. 28, 28*a*. That shell is larger and broader than the Californian shell, smoother and more shining—the spiral pitting microscopical, the shape of the mouth distinct, more effuse, outer lip and the whorl pinched in towards the center as in the Californian species—plicæ of columella slightly more oblique."* Upon further comparison between *M. orientalis* (*M. maura*), and *M. idæ*, Professor Melvill says of the first named, that it corresponds "exactly with the plate in Sowerby's Thesaurus Conchyliorum III, Pl. 354 (Mitra) t. 40, being a more incrassate, uncouth shell than *idæ* and apparently smooth, uniformly black; with a lens, slight pitting is discernable. The form of the mouth is also quite different from *idæ*."† He adds that English Conchologists "such as Mr. G. B. Sowerby, Mr. Edgar A. Smith, Mr. Sykes, and Mr. Fulton all recognize the specific differences between *idæ* and *maura* (*orientalis*)." Dr. Wm. H. Dall and Dr. Paul Bartsch also agree that, "The California species is distinct and should retain the name *M. idæ* Melv." ‡

The fine example (Fig. 7) of Mitra from Peru, received, through the courtesy of Professor Melvill, from Sowerby and Fulton, bears this label:

"*Mitra orientalis* Gray 1834
— *maura* Swainson, 1835
— *chilensis* Keiner, 1839."

The whole question evidently resolves itself into this: Swainson's *Mitra maura* has not been found upon the Californian Coast, and, Swainson's *Mitra maura*, on account of priority, is now called *M. orientalis.*§ *M. orientalis* is not found north of Cape St. Lucas, Lower California, and the geographical listing of this species is incorrect. While P. P. Carpenter lists *M. maura* among the Upper California Fauna in his Report on Moll. of W. Coast of N. Amer. in 1856,‖ in the British Rep't for 1863, he has this note: "*Mitra maura* Swains. Nutt. = *orientalis* Gray = *chilensis* Gray, Kien. Very dark and plain. Peru. Sand between rock l. w. Cuming," in Carpenter's Catalogue of Mazatlan Shells (1857) there is no mention of *M. orientalis* (*maura*) in place there are *Mitra lens* Mawe, and *Strigatella tristis* Brod. Dr. R. E. C. Stearns also lists *M. lens* and *M. tristis* among other Mitras but does not include *M. orientalis* among the "Shells of the Tres Marias" (Proc. U. S. Nat. Mus., Vol. XVII, pp. 139–204).

Of *Mitra idæ* in regard to relationship with other black Mitras from West Coast of U. S. A. and South America, Professor Melvill says: "lens, maura (orientalis), caliginosa, fultoni, idæ and others may have been derived from a common ancestor."

* Letter.

† Letter.

‡ Letter.

§ Of the name *orientalis* for this shell, Professor Melvill writes: "It is an unfortunate name, certainly, being a shell of the Western, not the Eastern hemisphere and is exactly in the same position, therefore, as *Cypræ* (*Trivia*) *madagascariensis*, which, as everybody knows, does *not* occur anywhere near Madagascar."

‖ Binney's Bibliography of N. Amer. Conchology, Vol. I, p. 300.

Mitra fultoni E. A. Smith.

Mitra fultoni Smith Descriptions of New Species of Shells from Mauritius and California (An. & Mag. Nat. Hist., p. 256, figured, March, 1892); Williamson, Some West Amer. Shells, etc. (Bull. S. Cal. Acad. Sciences, Vol. IV, No. 8) p. 123, 1905.

This shell, as well as Professor Melvill's, is described in a Latin note and is figured very finely. The type is from Point Abreojos, Lower California. Long. 39 mm. diam. 13; aperture 19½ long; 5 lat.

Dr. Dall writes he has seen "none from north of San Diego." Lately they appear to be very scarce at that place as Professor Kelsey says he has found none there.

In his description, Mr. E. A. Smith says: "This species is well characterized by the punctate sulci; the punctures falling in regular, longitudinal rows, through which pass well-marked impressed lines of growth." This character of punctate sulci is a very noticeable one; the pitting wider and deeper than in *M. idæ* is a prominent feature. As compared with *M. orientalis* Gray, Mr. E. A. Smith says: "The whorls are more convex, the epidermis blacker, and the fine spiral striæ which adorn the surface of that species are scarcely indicated in the present form." Professor Melvill says: "The outer lip is more effuse than in *M. idæ*." Fred L. Button, Esq., writes: "I have made a pencil sketch (for you) of my specimen of *Mitra fultoni* which gives a fair idea of this species. It is brown, has quite a shoulder below the suture and has a few indistinct revolving lines of sculpture." The figure referred to is more shouldered than any I have seen. While adult specimens of *M. idæ* and *M. fultoni* exhibit differentiation the young of both species might indicate a common ancestry at no very distant era.

Of the animals, Mr. Henry Hemphill writes: "The animals of all the Mitras found on the coast of Southern California, so far as I remember, are white, whether we call them all *maura* or *fultoni* or *idæ*." This agrees with d'Orbigny's note on tropical American species.

Mitra lowei Dall.

Mitra lowei Dall, Diagnoses of New Species* of Mollusks from the Santa Barbara Channel, California (Proc. Biol. Soc., Wash., Vol. XII, pp. 171–176, Dec. 31, 1903), Keep, W. Amer. Shells, 1904, p. 321.

This shell, dredged near Avalon, Santa Catalina Island, Cal., by Herbert N. Lowe, is described by Dr. Dall as belonging to a type of *M. fulgurita* Reeve,† but of markedly different proportions. The nucleus is very distinct from that of the type of *M. barbadensis*, etc. "The only specimen seen is clearly immature, but it is not the young of any of the species known to inhabit the coast and is sufficiently characteristic to be easily recognized." Length 5.5; of last whorl 4.5; diam. 2.5 mm.

This yellow-brown shell was dredged with other shells at a depth of water from 40 to 60 fathoms.

* In this paper Dr. Dall also describes *Mitra dolorosa* from the Gulf of Cal., but as this article does not include Gulf species it could not be listed.

† For geographical range of this species consult Dr. Dall's Marine Mollusks of S. Eastern Coast (Bull. 37, U. S. Nat. Mus.) p. 110, 1889.

Vol. XIX, pp. 199-200 December 31, 1906

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

GENERAL NOTES.

TYPE OF THE GENUS *ATHERURUS*, BRUSH-TAILED PORCUPINES.

The latest published statement of the type of the genus *Atherurus* F. Cuvier, so far as I am aware, is that by Dr. T. S. Palmer in his excellent Index Generum Mammalium (North American Fauna, No. 23, 1904, p. 127), where it is erroneously given as *Hystrix fasciculata* Shaw (Gen. Zool. II, pt. 1, 1801, p. 11), from Malacca. By reference to Shaw's descriptions, which are accompanied by good figures showing the peculiar tail bristles of the genera *Atherurus* and *Trichys*, *H. fasciculata* is readily seen to be a member of the genus *Trichys*. F. Cuvier (Dict. Sci. Nat., 59, 1829, p. 483), mentions no type for the genus *Atherurus*, but says of the tail, "est longue et terminée par un faisceau de lanières cornées, aplaties et étranglées d'espace en espace," which agrees with Shaw's figure and description of *Hystrix macroura* Linnaeus based on Seba's *Porcus aculeatus sylvestris* etc. (Seba I, p. 84, pl. 52), and not with Shaw's *Hystrix fasciculata*, the tail of which is "terminated by a tuft of long, flat hairs, or rather small, white laminae resembling strips of parchment." F. Cuvier refers *Atherurus* back to his brother's Les Atherures (Regne Animal, 1829, p. 215), which refers in turn to Buffon (Supplement, VII, p. 303, pl. 77). But Buffon's Malacca porcupine with its parallel-sided tail bristles is clearly Günther's genus *Trichys*, and not Cuvier's "Les Atherures." As the only name available for the porcupine with the beaded tail bristles at the time of Cuvier's description is *Hystrix macroura* Linnaeus, this name should stand as the type of Cuvier's genus *Atherurus*. See Jentink (Notes Leyden Museum, 1894, p. 207), who pointed out the type of *Atherurus* to be Linnaeus' *Hystrix macroura*. —*Marcus W. Lyon, Jr.*

NOTE ON *LIMNOMYS*.

In the Annals for March* I founded a new genus for a water-rat from New Guinea allied to *Hydromys* and gave it the name *Limnomys*. But I now find that this name was preoccupied for a genus of Muridae from the Philippines discovered and described by Dr. E. A. Mearns.† I therefore propose to rename the Papuan genus Drosomys, its type species becoming *Drosomys asper*. —*Oldfield Thomas.*

* Ann. & Mag. Nat. Hist. (7) XVII, p. 325, 1906.

† Proc. U. S. Nat. Mus. XXVIII, p. 451, 1905.

THE PROPER NAME OF THE MEXICAN TAMANDUA.

I am indebted to Mr. Walter L. Hahn, Aid, Division of Mammals, U. S. National Museum, for calling my attention to De Saussure's description of the Mexican Tamandua in his "Note sur quelques Mammifères du Mexique," published in the January, 1860, number of the "Revue et Magasin de Zoologie," (2e, Vol. XII, 1860, pp. 9–11). The description is based on specimens from the State of Tabasco, and is very satisfactory and complete, especially of the skull, and very clearly points out the cranial differences that distinguish the Mexican form from the "*Tamandua* du Brésil." He calls it "*Myrmecophaga tamandua* (?) Desm. (Var. *Mexicana*, Sauss.)." As this name has nearly forty-five years' priority over my *tenuirostris* for the same form (Bull. Am. Mus. Nat. Hist., Vol. XX, p. 394, Oct. 29, 1904), the correct name of the Mexican Tamandua is *Tamandua tetradactyla mexicana* (Saussure). As De Saussure's name *mexicana* is not given by Trouessart in his "Catalogus Mammalium," nor cited by Gray and other general writers on the group, it was easily overlooked in preparing my paper on "The Tamandau Anteaters." —*J. A. Allen.*

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